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LIGHT ⁘ HEAT ⁘ POWER ⁘ BYE-PRODUCTS

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Editorial Notes.

The Thermal Insulation of Retort-Settings.

In this topic there has been interest for generations, but not much in the way of practice. To save heat in the system of carbonization was at one time looked upon as an admirable sign of professional devotion, which would cost as much to effect as the saving would be worth. Fuel was cheaper then; knowledge had not reached its present level; and efficiencies were not so affectionately regarded as now. So it comes about that, following intermittent experimental work, it has only been within comparatively recent years that there has been scientific treatment of the subject. Messrs. A. J. Dale and A. T. Green have re-awakened interest in it by their contribution to the report of the Joint Refractories Committee, presented by Mr. J. P. Leather at the recent meeting of The Institution of Gas Engineers. We published an extract from their contribution last week. By the way, it is rather remarkable that, though the construction of retort-settings and their upkeep are so costly owing to the drastic service they have to render, the work of the Joint Research Committee does not appear to rouse the interest of the members when at the meetings. Probably they study the reports afterwards. Even so, it would be some satisfaction to those engaged in this work if some evidence of interest were given. Apparently a real effort is being made to increase interest, and more money is being found for extending the research. Of this we feel assured—that, if such practical contributions as the one on "The Thermal Insulation of Retort-Settings" are found year by year in the report, there will be a highly satisfactory growth of interest.

It is a notable fact that, in the early days of the consideration of the question of thermal insulation of retort-settings, the idea that loss of heat could be partly prevented by changes in design does not seem to have occurred to gas engineers. They had always in mind what is now described as an "after-thought"—an integument, a blanket, or envelope for the outer walls. They knew little or nothing of the science of the matter. Thirty to forty years ago we saw the external covering method of insulation applied to a horizontal retort bench in a shallow house in the North. But the Engineer had enveloped his vertical walls only, and left the top. The latter state of the upper part of that horizontal retort house and of the metal equipment on the top of the bench was worse than the first. Insulation is something more than trying to conserve heat by insulating a part only of the setting. As Messrs. Dale and Green show, there is much more in it; and it must be done scientifically and completely. Where only partial insulation is applied after erection, a new heat distribution or flow is set up compared with what existed before, and that is why, when the vertical walls were insulated in that bench of horizontals to which reference has been made, there was a great escape of heat from the top, to its detriment and that of the metal work.

In presenting the report of the Committee at the meeting of the Institution, Mr. Leather said the conclusion might be drawn from it that it is certainly worth while to insulate. Of course, that depends upon the resultant gains. On insulation an amount of money could be spent which probably the gains would not warrant—that is, insulation of the "after-thought" type. But to-day our leading retort builders are dealing with insulation (as is right and proper) as part of the design of the setting itself; and this is the most effective and economical course. But this condition is a growth from the large amount of experimental work on insulation external to the original design, which has shown us what to do, and what not to do. The authors, for instance, allude to the enlightening work of Mr. J. S. Thorman on the subject, before describing what is, of course, the modern and best practice—such as they refer to in connection with to-day's horizontal settings of Robert Dempster & Sons and Drakes, Ltd., and vertical settings of the Glover-West and Woodall-Duckham types. It is quite clear, from Mr. Thorman's investigation with "after" external insulation, that it can be carried too far. For instance, it does not do to apply the outer insulation too near the metal mouthpieces. It was found they became overheated. It therefore became a question of compromising between gain and loss, and this is achieved by cutting away several inches of insulating material round the mouthpieces. This, while eliminating serious overheating of the mouthpieces, has retained a considerable improvement in the temperatures towards the retort ends. The promotion of uniform retort-heating conditions is one of the gains from insulation to add to the saving of heat. In the Stretford setting the insulation is also kept clear of the mouthpieces. Among the advice of the authors, however, is that an alternative to cutting away of the insulation would be to avoid the overheating of the mouthpieces by inserting a special layer of insulation within the retort walls at these positions—thus lowering the temperatures of the inner ends of the metal work. They also suggest that there is need for the incorporation of insulation behind all metal work surrounding horizontal settings and in actual contact with the walls.

It is from the work of those who have indulged in "after-thought" insulation that it has been possible to lay down general guiding principles for the incorporation of insulation in the original design of horizontal retort-settings, and no doubt use was also made of the same information in the design of vertical settings. There is the point as to the low mechanical strength and small resistance to abrasion of normal quality diatomaceous bricks, which necessitate protection from the usual disintegrating effects prevalent in the average horizontal retort house, though at Stretford and Southall there has been good experience in that respect. If the insulating blanket is incorporated in the walls of the setting, care has to be taken that it is not exposed to an excessive temperature, so that shrinkage occurs which might easily nullify the thermal advantages of the insulating layer. Then another important thing is the type of tying between the inner and outer walls where the insulating material is between the two. Some interesting information on this point is included in a report from Mr. M. F.

Thompson (Drakes) and Mr. H. J. Toogood (Robert Dempster). Incidentally, the fact of metal sight-hole plugs being heat wasters is noticed. A substantial list of guiding principles for wall and top insulation is given in the report.

The views of West's Gas Improvement Company and Messrs. Woodall-Duckham were obtained by the authors regarding the advantages of thermal insulation on vertical retort-settings. One peculiar thing about this insulation question is that no one seems inclined to make any claim for definite fuel economy in connection with it, though there is satisfaction that economy is effected. Admittedly the difficulty of making an exact assessment is great. However, West's are of opinion that the economy is of the order of 5 p.ct. of the fuel consumption; and Woodall-Duckham opine that an approximate figure would be under 5 p.ct. of the coke burned in the producer. In determining a figure, much depends on the degree of loss incurred before insulation is adopted. There is here a field for investigation; but other important improvements are created by the insulation. The early installations of continuous verticals were uncomfortable for the men working on the top. The insulation in the settings as now adopted has certainly greatly improved conditions for them, has reduced the radiation on the gas off-take pipes, and has minimized trouble with the condensates. The report deals with other subjects—such as the Robert Dempster practice in their vertical type of settings, the insulation of waste-heat and producer-gas mains, and the location and types of insulation on vertical benches.

Although insulation has of late years been fairly largely applied to carbonizing plant, this examination of what has been done will have widespread interest, as it opens up the various phases of the subject in a way which will give ground to the practitioners to discuss theories and practices, and to derive practical value from the consideration. The position of the subject is well focussed in the "Summary and Conclusions" at the end of the report.

The Nethermost Gas-Works.

To those who are constantly reading about large and medium and other sized gas-works with business not below (say) 100 million c.ft. a year, or peaks that make that figure a hardly noticeable speck in a curve, there is fascination in having brought before them such information as is comprised within the Presidential Address of Mr. George Urquhart, of Tranent, to the Waverley Association. The gas-works which he manages had, when the story opens, an output of 4½ million c.ft. per annum, and now it is about 13 million c.ft.; but the gas to-day is of lower calorific value, so that comparison on the volumetric basis is not exactly accurate. The address is a narrative of the deplorable conditions in which Mr. Urquhart found the little works when he took charge of them; what he did to restore them to a state for carrying on the business; how he took opportunities to carry-out changes of, for his Company, a substantial character; and how he has succeeded in bringing about a growth of business which in the circumstances of Tranent is a remarkable testimony to tact and perseverance. How he succeeded in making gas with the plant that he describes as being in existence when he took the works in hand is a puzzle; and how he kept pace with the demands, with a storage of 19,000 c.ft. divided between two holders of 14,000 c.ft. and 5000 c.ft., invites and obtains our admiration. Prior to the coal strike of 1921, Mr. Urquhart was constantly engaged in doing something to improve his productive conditions; but—think of it, gas engineers who pride themselves upon maintaining supply in all circumstances—he looked upon that strike as a fortunate occurrence for him and his undertaking—in that it gave an excuse for completely shutting-down the plant for about five weeks, during which period the retort-settings were rebuilt, the hydraulic main levelled, the exhauster put into good state, new covers fitted to the purifiers, and all prepared for a fresh start. There seems to be pleasure in his recollections of what happened as a result of that shut-down. The stoppage did the undertaking no harm—in fact, the want of gas did more to popularize it than any Press advertisement could have done. There was consumption expansion in the district; and the time came when it was necessary to enlarge the producing plant.

A complete gasification plant on the Tully system was adopted. Mr. Urquhart had no fears regarding the loyalty of such plant in his circumstances; and he arranged matters to fit best the conditions of his Company. Much as he disliked giving-up even 5000 c.ft. of storage, he decided to use the smaller holder as a relief one, and to dilute from it his rich coal gas rather than carburet or increase the calorific value of the gas from the complete gasification plant. He worked to a 20 p.ct. breaking down of his rich gas. He certainly adopted the wisest course as things were at that time. Complaints came in. These did not deter him; he gave them his personal attention, and soon all appliances were adjusted to the new conditions. The ample service, although the calorific value was lower, stood well the campaign of the Lothian Power Company for custom on the introduction by them of electricity to the area. He then decided to duplicate the Tully plant, and supply the district wholly with that gas, aiming at producing a gas of 380 B.Th.U., or rather higher if possible. Everything has worked well; and the flexibility of the new plant proved invaluable during the coal stoppage of 1926. Though he has had so much success, he is not prepared to say that what is right in one district would be right in another. Other gas managers must do as Mr. Urquhart did—choose for themselves. In his case the number of consumers in 1922 was 325; in 1928, 900. The consumption increased (as already said) from 4½ to 13 million c.ft. The unaccounted-for gas—this is a mining area—was reduced from 19 p.ct. to 12 p.ct. There is good reason for congratulating Mr. Urquhart on his successful methods, in circumstances which do not offer the manager the same margin as in larger and thus more elastic conditions. Further efforts are being made on the commercial side; and we hope that in due season he will be able to show that they have brought to this well-managed, small concern a richly deserved success.

Could the Education Scheme Fail?

WE think not. But in the report which was prepared by the Chairman of the Education Committee (Mr. F. W. Goodenough), and presented at the annual meeting of the Institution, there appeared to be a combination of satisfaction regarding general progress and a shade of disappointment respecting the data as to entrants to the examinations. We do not share this feeling of disappointment. The numerical value of the figures is not their only aspect which has to be considered. Their qualitative value is important; and when we look into them from that angle (bearing in mind, too, that the numbers have not receded), we are gratified that the scheme has come into action to help the industry in a direction which has been sadly neglected, but is of paramount importance.

Now the qualitative condition in regard to the education and training of the candidates in the examinations with which the report deals could not in any manner have been affected by the three steps in the development of the scheme to which reference is made by Mr. Goodenough in the opening paragraphs. That fact is something over which there may be gratification, as it suggests that the influences of the setting-up of District Gas Education Committees, the part that the examinations will take in qualification for membership of the Institution, and the courses for teachers have no relation to the candidate figures in the present report. We believe fully that all three new steps in the development of the scheme will have marked advantageous results in the time to come. It cannot be expected that they will show marked results immediately, although the setting-up of the District Committees has already quickened interest throughout the industry, and has opened-up consideration where this had not been given before. Moreover, the part which the Higher Grade Certificate and the Diploma are to take in future in the membership of the Institution has quickened the interest of those who are wanted as students, and ultimately as candidates for examination. With interest extended in both directions, the year can claim something good in constructive work for the scheme.

As already mentioned, the number of candidates who

entered for the various examinations shows an increase on those of last year—not so large as had been hoped, but still large enough to show a steady growth. We think the figures are eminently satisfactory. In the tables we are at once brought face to face with the qualitative aspect in respect of attainments of the candidates, which we regard as an excellent sign. It will be noted that, although there were fewer candidates for the Ordinary Grade in Gas Engineering, there was an increase in the number in the Higher Grade; and upon this comes the fact that there were eighteen candidates qualified to sit for the diploma, as against eight in 1927. That is qualitative progress; and it is what the industry wants. The same thing applies to Gas Supply. There we find an increase from 60 to 83 in the Ordinary Grade, and from 16 to 18 in the Higher Grade. For the first time, too, there were entrants for examination for the Diploma in Gas Supply. It is the view of the Committee that, though progress is shown, the figures still fall far short of what they should be in the interests of the industry. It is inevitable there should be some ebb and flow in the numbers presenting themselves for examination year by year; but it is their opinion that the flow is not yet as great as it should be if the best interests of the industry are to be served. We must not forget that the gas industry has its limits; and our expectations must not be pitched in excess of them. At the same time we should not be at all averse to see more life especially on the Gas Supply side, because it is there that the current need is so great for men of suitable qualification. But we have the satisfaction of knowing that, in addition to the good aspects of the position as we see them in the report, the three influences to which allusion is made in its preface have yet to come into full play. The District Committees will no doubt also have a big influence in bringing about that fuller co-operation for which the Committee appeal—the co-operation of administrators and heads of undertakings, so that the education and training of those who in future will (to use the words of the report) be called to positions of responsibility in the industry, and of those who are engaged in service to the public, may be fully equal to what is demanded by modern circumstances. The scheme will not fail.

Surplus Coke.

THE minutes of a meeting of the Council of The Institution of Gas Engineers held on the eve of the annual meeting contained this statement: "A report of the "Conference on Coke Development which took place on "May 21—Mr. C. S. Shapley in the chair—was presented "and adopted. The following resolution was passed at "the conference: 'That a Sub-Committee be formed to "'go into the question and prepare a scheme for having "'agents in the Commercial Sections of each District "'Association for the disposal of surplus coke.'" We are pleased there is this evidence of an active move being made in this direction, because, despite some of the fine things that the optimists say as to the efficacy of grading, &c., in promoting markets for gas coke, we hear from time to time complaints regarding serious accumulations of coke stocks and the poor outlook for the first of the industry's secondary products. The fact of the matter is (omitting consideration of seasonal effects) that what the gas industry is generally doing to improve the conditions of coke trading is insufficient for the changes that are taking place outside such questions as grading and suitability.

Only simpletons now regard gas-works coke as being the one smokeless pebble on the beach for domestic and light industrial fuel purposes. There is the competition of the coke-oven product from better prepared coal charges than usually obtain in gas-works, and the better quality of the oven coke will naturally influence its patronage. To quality an attractive price is being added so as to induce people to give the rival a trial. Thus it is that the supply of coke is to-day particularly obtrusive—more so than it was a few years ago when there were the same complaints of a deficiency in demand, and of stocks of great magnitude cumbering the ground at the seats of production. We have to bear that in mind when considering the relief measures which must now be taken; it is no good limiting them to the measures of the past. There are also the signs of home and overseas demand being at a low level although supplies are so abundant. In an article by Sir Felix Pole, the General Manager of the Great Western Railway, which appeared in the "Great Western Railway Magazine," and from which the daily papers made quotation last week, he spoke of the serious decline in railway receipts. In the first five months of this year, the net revenue decreases for the Great Western totalled to £864,000, and of this no less than £324,000 was due to a falling-off in coal and coke traffic. That is a serious fall of revenue, and a clear indication that a large volume of fuel is not required in the immense territory through which his Company winds its way. Then seeing that gas-works alone produce about 8 million tons of coke, an export of 354,653 tons in the first five months of this year is nothing to boast about. It is rather better than in the corresponding period of 1927, when the total was 279,274 tons, but that was the period when we were emerging from the coal strike, and were not very keen sellers abroad, except at heavy prices, in view of the requirements at home. In the five months of 1926, the sale was 367,227 tons. On the other hand, the coke-oven people are doing a larger business. In the first five months of this year, their overseas business amounted to 474,530 tons; in the same period of 1927, to 177,860 tons; and in that of 1926, to 373,235 tons. So to competition with gas-works coke we have to add the smaller demand both at home and abroad. In view of the large vogue for enclosed stoves and central heating on the Continent, we are wondering whether the coke-oven people are eating into our overseas coke markets.

Then there is the old complaint as to the large gas undertakings dumping coke into their neighbours' areas at lower prices than the local production would command if it were not for these importations from outside. We are not going to defend this sort of thing; but in some cases the exporting concerns are not altogether to blame. The local and aggrieved concern should ask itself whether or not it is involved in the conditions which make the competition from an outside concern possible. It is not always price alone that is effective; there are cases where both price and the quality of the coke are the commendations. If a local concern thinks it is wrong that it should not get a higher price than an exporting neighbour when the purchaser finds that the latter gives better qualitative value both in respect of ash and moisture at a less price, then the local concern must be governed by men who know little of human nature. They have really nothing of which to complain. They must work competitively, and see that the factors which govern successful trading have an equality in their own product with those of their rivals. It is only common sense.

It will be interesting to learn the decision of the Sub-Committee who are to go into the question of having agents in the Commercial Section of each of the District Gas Associations for the disposal of surplus coke. It is a bigger question than appears on the surface. We know the success the London Coke Committee have had in developing demand; but since they commenced to function circumstances have altered, and now we think the Sub-Committee will have to get a little farther back than the consideration of the plain question whether or not selling agents should be appointed for the disposal of surplus coke. They will have to consider what causes the surplus—whether the character of the material itself is partly responsible, because, if it is, then the less the Commercial Sections have to do with its sale, the better in the interests of those who have been trying to effect qualitative improvement. However, a move is being made which should have an excellent effect.

Institution Committee on Ammonia.

Overleaf will be found announcement of the constitution of the recently-formed Committee on Ammonia and the proposed scope of the preliminary survey of the production and disposal of ammoniacal liquor at gas-works. In view of the development of synthetic methods of manufacturing sulphate,

the matter is one of great urgency from the commercial aspect; and Mr. C. F. Botley, the Chairman of the Committee, asks for information and assistance which will contribute to the full consideration of the question.

Terms that are Inconsistent with Facts.

There is considerable liveliness in the gas industry at the present time in connection with the establishment of showrooms that are up-to-date, holding exhibitions, extending works, and spending money on distribution in a manner which reveals the large faith there is in the industry regarding its future part in the service of the country. As is reported in this number, new showrooms were opened at Batley towards the end of June; and one of the speakers was Mr. W. M. Mason, Manager of the British Commercial Gas Association. The tenor of his remarks seemed to indicate that there are a number of people who are so foolish as to think that gas is a back number. If that be true, we need not remind them of it; but when we compare the expanse of business of the gas industry with that of the electricity industry on the thermal basis, or from the point of view of numbers of consumers, we are disinclined to think that a "large number" of people really exist who harbour such fiction. To Mr. Mason, too, is attributed the statement that "behind the public mind there is probably the idea that gas is old-fashioned, but sometimes things accrue in value the older they get." Is there not the suggestion here that there must be something in the idea—otherwise we should not take the trouble to make the reference? Should we not rather claim that the whole world admits that gas is an indispensable agent? Practically universal use is sound evidence.

Another Picture.

A different impression is made by the report of the opening of the Modern Homes Exhibition at the beginning of last week at Ipswich, the responsibility for organizing which was undertaken by Radiation Ltd., with the enthusiastic assistance of the Ipswich Gas Company. The Mayor of Ipswich (Major W. Rowley Elliston) performed the opening function; and although he is interested in municipal electricity enterprise, he had nothing to say about gas being a "back number" or "old-fashioned." In fact, all his life he has been a free trader; and he believes the best results can be obtained by unrestricted competition. In fact, he went farther, and said competition was good for everybody, and for every industry. Mr. Henry Woodall, the Chairman of the Ipswich Gas Company, could not be present; otherwise he would have supported frankly and freely the free-trading sentiments of his Worship. This exhibition was something out of the ordinary. It had the civic blessing; and there was a luncheon by the Directors of the Gas Company. At the luncheon, Mr. R. W. Cobbold acted as Mr. Woodall's deputy. He made it clear that gas is not afraid of competition so long as it is not unduly loaded against gas. Mr. Cobbold was referring to municipal competition, which is not always based on commercial principles. But, of course, so far as value for money is concerned in all forms of heating, it is impossible for the competition to be loaded against gas. Mr. F. W. Goodenough's remarks on the occasion showed this. Probably we shall hear of more Modern Homes Exhibitions, in view of the success of this one at Ipswich.

The Test of Failure.

In a recent speech referring to the Five Counties Coal-Marketing Scheme, Mr. C. A. Cochrane, the Chairman of the Bolsover Colliery Company, stated that more coal is being exported from the Humber than has been the case for some time. Of course, they are doing this by subsidizing the coal. Mr. Cochrane's view is that the sole object of the scheme is to bring back prosperity to the coal trade; and if it does not do this, it will have failed. What is the test of prosperity with subsidized coal?

Coal and Rating Relief.

There are some selfish persons who think that the Government should differentiate between the various classes of coal for the purpose of rail freights under the rating relief scheme. The Government, it is understood, have decided that it is not possible to do this. They consider the benefits to be conferred must be of general application; and one of the grounds on which they base this view is that, as other industries have been led to expect advantages by the lowering of freights, it would be improper to limit the area of relief. While the Government have made up their minds against action in the sense indicated, it does not rule out the possibility that some special and early relief may be given to the coal industry. The position is being carefully reviewed; and there are hopes that something may be done to help the coal industry to tide over the period until the rating relief scheme as a whole comes into operation in the autumn of next year.

A National Industrial Council.

Practical results are beginning to emerge from the joint conferences of the General Council of the Trade Union Congress and the group of representative employers, headed by Lord Melchett. Last Wednesday the joint body issued a report which contains six resolutions on trade-union recognition, victimization, and other points of possible friction; and then there is the outstanding declaration that it is desirable, for the continuous improvement of industrial reorganization and relations, that a National Industrial Council should be formed, and that immediately. As to composition and functions, it is recommended that the Council should consist of the members of the General Council of the Trade Union Congress, and an equal number of representatives of the employers nominated by the Federation of British Industries and the National Confederation of Employers' Association. As to their functions, quarterly meetings are to be held for general consideration on the widest questions concerning industry and industrial progress; a Standing Joint Committee is to be established for the appointment of Joint Conciliation Boards as set out in detail in the agreed resolution on the prevention of disputes; and to establish and direct machinery for continuous investigation into industrial problems.

INSTITUTION COMMITTEE ON AMMONIA.

In introducing the Second Report of the Effluents Research Committee at the annual meeting of The Institution of Gas Engineers in Cardiff, Prof. J. W. Cobb referred to the fact that a Special Committee had been set up to consider the position of the gas industry in regard to ammonia production and disposal—an urgent question in view of the development of synthetic methods of producing sulphate. From Mr. C. F. Botley, the Chairman of this Committee, we learn that it is constituted as follows: Prof. J. W. Cobb, Dr. A. Parker, Mr. T. F. E. Rhead, Mr. H. Hollings, Mr. E. V. Evans, Mr. P. G. G. Moon, Mr. H. E. Bloor, Mr. J. Wilkinson, Mr. W. W. Townsend, and Dr. E. W. Smith.

The urgency of the matter from the commercial point of view of the production and disposal as sulphate or otherwise of ammoniacal liquor is at the present time so apparent as not to need emphasis; but the Chairman invites, on behalf of the Committee, any information or assistance which will contribute to the full consideration of the question.

For the purpose of the preliminary survey, individual members of the Committee have undertaken to prepare critical reports on various sections, though this, of course, does not exhaust so comprehensive a subject. The sections are as follows:

(*a*) The present position of ammonia and compounds of ammonia, with particular reference to synthetic processes for the manufacture of nitrogen compounds and nitrate of soda.
(*b*) The economics of concentration of ammonia liquor, with particular reference to small gas-works.
(*c*) Reduction of operating costs in ammonia recovery with existing plant at gas-works.
(*d*) The recovery of ammonia from gas-works as compounds other than sulphate.
(*e*) Direct and semi-direct ammonia recovery applied in gas-works.
(*f*) Liquid purification of coal gas by means of ammonia.
(*g*) The zinc process for recovery of ammonia and sulphur from gas.
(*h*) The Burkheiser process.
(*i*) The Feld and similar processes, excluding those to be considered by sections G and H.

Communications can be addressed to Prof. Cobb (Secretary), The University, Leeds, or to the Secretary of The Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1, or to Mr. Chas. F. Botley, Gas Company's Offices, Queen's Road, Hastings.

PERSONAL.

MR. J. H. SILLITOE.

The Manchester City Council have approved the recommendation of the Gas Committee to appoint Mr. J. H. Sillitoe as General Manager and Secretary of the Gas Department. Mr. Sillitoe entered the service of the Committee in 1900. He was appointed Assistant Statistician in 1912, and six years afterwards second Assistant to the then Superintendent, Mr. F. A. Price. In 1920 he was appointed Assistant Secretary, and Secretary in 1923. Mr. Sillitoe, who is a Chartered Secretary, and has specialized over a number of years in the study of economics, has therefore sixteen years' administration experience in the gas undertaking. For the past nine years he has acted as Secretary to the Manchester District Executive Board of the National Gas Council, and the Manchester District Committee of the Federation of Gas Employers; and when the British Commercial Gas Salesmen's Circles were formed five years ago, Mr. Sillitoe was elected the first Chairman of the Lancashire District (Manchester Section).

Mr. ARTHUR F. BEZANT, Editor of the "JOURNAL," desires to thank those many friends in the industry who have sent him messages of sympathy and good wishes in his recent lapse from normal health. Though he has not been at the office, he has been able to make his usual contributions to our pages.

On June 30, Mr. F. W. GOODENOUGH, C.B.E., completed 25 years as Head of the Gas Sales Department of the Gas Light and Coke Company. To celebrate this event, the 77 officers now on his staff who were appointed to it on July 1, 1903, entertained him at dinner at the Restaurant Frascati on the evening of July 2. Happiness prevailed, and the affection in which Mr. Goodenough is held was shown in an enthusiastic manner when the Chairman, Mr. J. E. Henwood, proposed the toast of "Our Guest," and presented him with a bound autograph programme of the evening, and a silver salver suitably inscribed.

Mr. G. PENNINGTON will shortly be terminating his engagement with the Sittingbourne District Gas Company, having been appointed Engineer and Manager to the South African Lighting Association, Ltd.

Mr. GEORGE E. H. KEILLOR, Assistant Engineer and Manager to the Dunfermline Gas Department, has been appointed Assistant Manager (under Mr. S. Barker Johnson) of the Colombo Gas and Water Company, Ltd., and will leave this country about the end of October to take up his new duties.

Mr. F. P. SMITH, the Financial Controller of the Manchester Gas Department, has tendered his resignation after forty years' service, and is retiring on superannuation under the conditions of the Corporation's Act.

Mr. GEORGE E. HILTON, late Chairman of the Leicester Gas Committee, has been presented with an inscribed silver tray by the Engineer and Manager, Mr. Hubert Pooley, on behalf of the Engineer, officers, and men of the Gas Department at the City Gas Offices.

Messrs. Sawer & Purves have appointed Mr. F. G. AMBLER (who has lately represented Messrs. Cockey & Co., of Frome, and was formerly Assistant Engineer at the Nelson Gas-Works) as their representative.

OBITUARY.

The death has occurred of Mr. JOHN E. WILLIAMS, Chairman of Messrs. John E. Williams & Co., Ltd., Victoria Paint Varnish and Enamel Works, Partington, near Manchester. Mr. Williams has been, through his firm, connected with the gas industry for the last 66 years. He was one of the founders of the Society of British Gas Industries, and a past Chairman of Section 8. His loss will be felt by many of the older generation, for his genial nature endeared him to everybody. He was very active in the management of the Company of which he was Chairman. He was well known in the Masonic world, for he was for 60 years a subscribing member of the "Integrity Lodge" No. 163, his provincial rank being Past Provincial Grand Warden. He was a founder and member of the "Northern Star Lodge" No. 3053; a founder and hon. member of the "Manchester Engineers Lodge" No. 4082; and had passed through the Chair of the Mark Degree; held the rank of D.P. Grand Organist; and was also a member of the Royal Arch Chapter, the Allied Degrees, and the Order of the Secret Monitor. Mr. Williams leaves a widow, one married daughter, and four sons. Two of the sons, Mr. Maurice L. Williams and Mr. Bert Williams, for some time have had the active management of the firm as at present constituted.

It is with much regret that we learn of the death of Mr. WILLIAM CHAFFER, of Sutton, on June 28, who was the London Manager of Messrs. C. & W. Walker, Ltd., for a period of over thirty years. He retired in 1926 owing to failing health. He had actually been in the employ of the firm for over 44 years, and was well known and much respected by a large number of gas engineers in the South.

The death has occurred, at the age of 79, of Mr. GEORGE SAUNDERS, for many years Secretary of the Kingsbridge Gas Company. A well-known public man, he has served as Chairman of the Urban District Council and in other leading capacities.

The death has taken place, on July 4, of Mr. WILLIAM EDWARD WALTON, Secretary of the Bishop Auckland District Gas Company.

ELECTRICITY SUPPLY MEMORANDA.

Cooking and Heating on Housing Estates.

OUR electrical friends can do with sympathy and encouragement in connection with cooking and heating on housing estates. There has been precious little of either so far; and when in this relation a faint ray of sunshine peeps out for them, there must be no envy. It will be remembered that, as an experiment, the Housing Committee of the London County Council installed electricity in a group of 57 houses on the Castelnau Estate. The installation has been in use for some months; and the Committee report that inquiries as to the use by the tenants of the electric cooking and heating apparatus "leave no doubt that most of them appreciate the facilities afforded, and are satisfied generally with the results obtained." That is a discreetly worded statement There is nothing extraordinarily binding about it. "Most of them appreciate the facilities afforded." Naturally, seeing that the more economical facilities of gas are not provided. Again, there is a broad generalization about the words "are satisfied generally with the results obtained." Our electrical contemporaries do not appear to be greatly impressed by the none too flattering statement regarding this small test of good behaviour, notwithstanding that it has resulted in the Committee asking the County Council to authorize electricity being installed in the tenements in the central (No. 1) block of dwellings to be erected on the Ossulston Estate. The terms upon which the St. Pancras Borough Council (within whose area lies this estate) supply their consumers with electric energy for cooking and heating are such that the energy costs should be lower than have resulted on the Castelnau Estate. The weekly standing charge would work out to about 5¼d. per tenement, which is comparable with a standing charge at the Castelnau Estate, varying according to the size of the houses, of from 7¾d. to 10½d. a week. The secondary charge of ½d. per unit compares with 1d. for the six winter months, and ½d. for the six summer months, at Castelnau. There would, of course, be the hire charges for the apparatus. The Committee, in further comments, state that "one" of the adverse comments on electric cooking is the time taken to boil water on the hot-plate; but "this difficulty can be largely overcome by the use of an electric kettle with a separate plug." Poor souls! They want to boil other things besides a kettle of water. This question is being further investigated at Castelnau Estate; but in the case of the Ossulston Estate, the difficulty, it is said, will not arise to the same extent, as hot water from the central supply will be available in each tenement. It is noted that the tenants are to share in a limited number of electric wash boilers. We hope they will not quarrel over them.

Capital Costs of the Heating and Cooking Load.

Electrical engineers are not disposed to drop the question of the cost of increasing distribution capacity, should the electric heating and cooking loads become considerably augmented. Speaking on a paper by Mr. A. F. Berry in the Electricity Section of the Charter Centenary of the Institution of Civil Engineers, Mr. F. W. Purse, of West Ham, refused to agree with a submission that, when general electrification has been developed efficiently, the lighting peak load will be negligible. That will never be the case, taking the load throughout. It is the view of Mr. Purse that electrical engineers have not generally appreciated what is going to be the effect of the peak loads for cooking and heating. His own experience is that in his district electric cooking is going ahead "very rapidly;" but when he receives particulars of voltage drops, and when his distribution department get out estimates for maintaining pressures, involving a transformer kiosk in every road, it begins to make him think. In such circumstances, if the charges for the ser-

vice are too low, there will be nothing to play with at all; and he feels he will be up against the capital charges on the main. That is, of course, the practical view; but there are others in the electrical engineering profession or without the responsibility of a chief executive officer—such as journalists—who say: "Get on with the job. Get as many cooker and heater connections as you can, and let things right themselves as you go along." That, of course, is not business. It shows no appreciation of responsibility. Matters can be allowed to drift in such a connection until considerable harm has been done and a set-back has taken place which it would not be easy to wipe out. Then what of the future? Some of the men who to-day give the above advice would then be glad enough to shift on to other shoulders the financial mess they have created.

Fuel Costs and Load Factors.

There have been in our contemporaries some interesting references to fuel costs. In the "Electrical Times," Mr. Rendell-Baker, of Halifax, recently claimed that he had brought his fuel costs down to 0·1011d. per unit generated; to 0·107d. per unit for the month of May; and for one week (ended May 16) to 0·09758d. The North Wilford power station at Nottingham during April and May beat Halifax. The average cost of fuel during the two months was 8s. 3d. per ton; but the stuff was of comparatively low grade—the average calorific value in April being 10,230 B.Th.U., and in May 9970 B.Th.U. The actual cost of fuel during the two months was 0·0921d. per unit generated, and 0·09615d. per unit distributed. Preston, for the Ribble power station, thinks it stands well in the running, with coal costs for the week ended May 13 at 0·097d., and for the whole month at 0·0993d. The cost of fuel was 11s. 1d. per ton, with a calorific value of 10,400 B.Th.U.; the thermal efficiency being 19·66 p.ct. Another aspect of the fuel question was touched upon by Mr. Purse at the Institution of Civil Engineers' Charter Centenary. He sought to show that load factor does not necessarily affect fuel consumption per unit generated. The last return of the Electricity Commissioners shows an undertaking which has a load factor of 42 p.ct., but its coal consumption is 5·39 lbs. per unit. This because its output is only 2 million units. Manchester has actually the lowest coal consumption per unit. It has a load factor of 53 p.ct., and consumes 1·33 lbs. per unit. The one next to that is where the load factor was only 24 p.ct., and the coal consumption 1·71 lbs. per unit. What is the reason for this? An output of 133 million units! Mr. Purse's contention is that it is the load factor combined with increased size of output, and not the load factor alone, which counts.

When the Change Comes.

There has been a large amount of comment lately regarding the question of the displacement of technical staffs when the national generating scheme has fully matured in any locality. The staffs are now receiving the verbal sympathy of town councillors and technical journalists. Of course, the local engineer and manager will still be wanted. Though he will have no current to produce, but will buy from the one and only authorized wholesale house, he will be responsible for the supply undertaking and for its development; and only through general development in sales will the huge power stations be a success. The one goes with the other. That will be one effect of the 1926 Act—the concentration of the chief executive officer on distribution and supply, while, of course, keeping an eye on the accounts which the Central Electricity Board send in. Another point which a "Sales Engineer," writing in the "Electrical Times," thinks will encourage the stimulation of local supply is the restriction to 1½ p.ct. of the amount of profit which may be applied to the rates. It has required, in some cases, a large amount of labour to get the fact well home that the old days of liberty in this respect have passed, never to return. But councillors are now all grasping the truth; and they do not like it. There is nothing spectacular about 1½ p.ct. in relief of the rates. The "Sales Engineer" in his letter reminds that in the past some municipalities have been anxious to supply their neighbours, because they felt this could be given on terms which would be of appreciable benefit to their own ratepayers. But the 1½ p.ct. restriction, it would appear from certain discussions at committee meetings, is changing administrative view on the subject of external trading—owing, first, to the fact of the limitation, and, secondly, to the alternative form of profit making—that is, incurring out of revenue expenditure of a capital nature, which is discouraged by the Electricity Commissioners. Hence the new conditions will promote the tendency among municipalities to concentrate more and more upon the development of supply to their own ratepayers at the lowest possible prices. "Sales Engineer" is thanked for the information; and we assure him that the point will be duly noted by those among our readers who are interested.

Standard Prices.

There appear to be good and justifiable reasons for fairly marked differences between the standard prices for the electricity companies of London. The matter has been under negotiation and discussion for a long time; and now the Electricity Commissioners are dealing with the matter. They have so far determined the standard prices for six of the companies as follows:

—	Standard Prices.	
	Street Lighting.	Private Consumers.
	Pence per Unit.	
Brompton and Kensington Company	2·00	4·604
Chelsea Company	..	4·423
Kensington and Knightsbridge Company	1·295	3·004
Notting Hill Company	2·00	4·168
St. James and Pall Mall Company	..	2·917
Westminster Corporation	1·064	2·766

For the eight remaining companies, the settlement of outstanding points and the determination of standard prices are being proceeded with as rapidly as possible.

Mishaps.

Louis Powell (age 16) has been electrocuted at the premises of Mac Fisheries, Ltd., Broadway, Wimbledon. He was heard to cry out, and was found hanging to a fish-hook suspended from an electric lamp holder. A woman who was walking in Cross Street, Hatton Garden, last Tuesday, had an experience which she did not enjoy. The cover of an electricity pavement box blew off. The woman was spun round, and blown several yards up the street. While engaged in fixing electrical fittings on the 5th inst., Henry Price (16), employed by Messrs. Brough, of Liverpool, was electrocuted.

FORTHCOMING ENGAGEMENTS.

July 13.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—Quarterly Meeting at Leek.
Aug. 14-15.—IRISH ASSOCIATION OF GAS MANAGERS.—Annual conference in Belfast.
Sept. 5-7.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual general meeting in Edinburgh.
Oct. 22-24.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual Conference at York.

THE INSTITUTION OF GAS ENGINEERS.

All meetings take place in the Council Room at 28, Grosvenor Gardens, unless otherwise stated.

July 16.—Emergency and Finance Committees and Benevolent Fund Committee of Management in the morning; Royal Charter Committee meeting and Council meeting in the afternoon.
Sept. 10.—Emergency and Finance Committees and Benevolent Fund Committee of Management in the morning; Council meeting in the afternoon.
Oct. 8.—Emergency and Finance Committees in the morning; Council meeting in the afternoon.
Oct. 9.—Gas Education Committee.
Nov. 12.—Emergency and Finance Committees in the morning; Council meeting in the afternoon.
Nov. 13.—Executive Committee of Gas Education Committee.
Dec. 10.—Emergency and Finance Committees in the morning; Council meeting in the afternoon.
Dec. 11.—Executive Committee of Gas Education Committee.

North British Association of Gas Managers.—The annual meeting of the Association will be held in the Masonic Hall, George Street, Edinburgh, on Thursday, Sept. 6. The annual excursion will take place on the following day, and will be in the form of a visit to the Scott country, including Abbotsford, Melrose Abbey, and Dryburgh Abbey. There will be a reception and dance on the evening of Sept. 6. The golf competition will be held on Sept. 5 over the Bruntsfield Golf Course; and there will be a bowling competition. The Council of the Association have nominated Mr. H. G. Ritchie, of Falkirk, for the office of Junior Vice-President.

Association of Private Owners of Railway Rolling Stock.—The Thirty-Seventh Annual Meeting of this Association was held at the Midland Grand Hotel, London, on Friday, June 29, under the presidency of the Chairman, Mr. John Charrington. In moving the adoption of the Committee's report and the balance-sheet for the past year, the Chairman commented on the satisfactory financial position of the Association and the strength of its membership. At the same time, he pointed out that, in order to maintain and promote the interests of private ownership to the fullest extent, every private owner should be enrolled as a member; and he expressed the hope that any who had not yet done so would apply to the Secretary, Clarence Chambers, Gloucester, to join without delay. The Chairman then referred in detail to the various matters of importance and intricacy which had been dealt with by the Committee during the past year and brought to a successful issue.

ALKALI WORKS CHIEF INSPECTORS' REPORTS.

There have been published in one pamphlet, by His Majesty's Stationery Office, Adastral House, Kingsway, London, W.C., and Branches (at the price of 1s. 3d. net), the reports of the Chief Inspectors of Alkali, &c., Works, on the proceedings during the year 1927. These reports are made respectively to the Minister of Health and to the Scottish Board of Health.

It is remarked by Dr. T. Lewis Bailey (the Chief Inspector for England and Wales) that the number of works registered under the Alkali, &c., Works Regulation Act of 1906 was 1131, which entailed the inspection of 1844 separated processes. This, as compared with the previous year, was a reduction of 21 in the number of works and of 23 in the number of processes. During the year an Order was prepared under section 4 of the Public Health (Smoke Abatement) Act, 1926, for extending the list of noxious gases and of scheduled operations to which the Alkali Works Regulation Act shall apply. No objections have been raised; and the Order has now been laid before both Houses of Parliament. The additions which the Order proposes to make to the gases and fumes embraced within the expression "noxious or offensive gas" include ammonia and fumes from benzene works. Among the extended descriptions of works scheduled are tar works, to which the Order will have the effect of attaching "and works in which creosote or any other product of the distillation of gas tar or coal tar is distilled or is heated in any manufacturing operation involving the evolution of any noxious or offensive gas." Then the additional works to be scheduled include: "Benzene works—that is to say, works (not being tar works as already defined) in which any wash oil used for the scrubbing of coal gas is distilled, or in which any crude benzole is distilled;" and also works in which pyridine is recovered.

SULPHATE OF AMMONIA AND GAS LIQUOR WORKS.

The report notifies a further slight decline in the number of sulphate of ammonia works; this being due to reasons with which "JOURNAL" readers are familiar. On this point, Dr. Bailey says: "It is not heartening to come across instances of this liquor being run to waste, as one has seen it so disposed of in places where the situation of the works admits of this being done without nuisance. What the gas-works manager needs is a method of making a readily saleable ammonia product without the necessity of purchasing an additional intermediate such as sulphuric acid. He wants a self-contained process; but so far this is not forthcoming, although in the past many attempts have been made in this direction."

It is gratifying to learn that there is no serious adverse comment to make this year as to the way in which operations have been conducted at these works. Three complaints were received; but in no instance could a definite charge of creating a nuisance be maintained.

AMMONIA PLANT EFFLUENT.

Further laboratory work has been carried out in connection with the ammonia plant effluent problem. Details of this work are set out in an appendix to the report. In this are a chapter on the analysis of ammoniacal and spent liquors, a note on the estimation of polyhydric phenols, a series of tables relating to analyses of condensates and effluent made at gas-works using a final acid catch, and the following analysis of ammoniacal liquors from low-temperature carbonization of coal:

Analysis of Ammoniacal Liquors from Low-Temperature Carbonization of Coal.

[Retorts Internally Heated—With Addition of Steam.]

—	Process A.	Process B.
Character of liquor	Yellow-brown, cloudy.	Yellow, clear.
Analysis (pts. per 100)—		
Ammonia: Free	0·72	0·24
,, Fixed	0·09	0·06
Total	0·81	0·30
Sulphide, as H_2S	0·03	0·03
Cyanide, as HCN	*Nil*	*Nil*
Monohydric phenols, as C_6H_5OH	0·424	0·244
Thiocyanate, as CNS	0·016	0·007
Thiosulphate, as S	0·013	0·022
Colour-producing bodies (including higher tar acids), as $C_6H_4(OH)_2$	1·0	0·06
Oxygen absorbed (pts. per 100,000)—		
Burette aeration test for higher tar acids (16° C.)	160	14
Permanganate test (4 hrs., 27° C.) (excluding sulphide by calculation) calculated as due to—		
Phenols	755	435
Thiocyanate	13	5
Thiosulphate	11	20
Other forms (including colour-producing bodies) by diff.	523	105
Total found	1302	565

With regard to the analyses of condensates and effluent made at gas-works using a final acid catch, three condensing systems were dealt with; and the plant at Works C is thus described: There are two water-tube condensers, all the liquor from which is sent to the storage well, and thence to Livesey and Maclaurin washers, each of which has its separate supply. The coal gas passes from these washers to an acid catch, and then through two rotaries, charged every ten days with a limited amount of water. Analysis indicates, however, that these final scrubbers serve no really useful purpose.

LIQUOR FROM VERTICAL RETORT PLANTS.

Dr. Bailey remarks in his report that the displacement of horizontal retorts in many gas-works by vertical retorts for the manufacture of coal gas may be said to have brought with it two essential differences in the character of the ammoniacal liquor. There is an increased percentage of higher tar acids, and the ammoniacal liquor generally obtained is weaker, as regards ammonia, by reason of the relatively large proportion of undecomposed steam passing forward, where steaming of the retorts is practised.

The former has caused attention to be drawn to the methods of extracting tar from the crude gas; and it would, says Dr. Bailey, appear to be most desirable that this should be effected as completely as possible at an early stage, with a view to reducing contamination of the ammoniacal liquor by higher tar acids and other constituents, which is found to be excessive when there is undue contact of liquor with tar in storage wells or in other parts of the plant. Treatment of the crude gas by means of liquor sprays has been inaugurated at some works; the effect of dynamic treatment is being investigated; and particularly in other countries work has been carried out on the line of electrostatic precipitation. The comparatively near future should, he thinks, provide information which will have considerable bearing on the effluent question.

WEAK LIQUOR.

The weakness of the ammoniacal liquor in the case of vertical retort plants is prejudicial in the subsequent manufacture of sulphate of ammonia. One obvious line of action, which has now been adopted with success at several works, is, Dr. Bailey remarks, to cut-out the final water scrubbing that is usually employed for completing the extraction of the ammonia from coal gas. A thorough cooling of the crude gas by means of water-tube condensers, followed by a scrubbing with weak liquor from the earlier section of these condensers (cooled before use), gives a satisfactorily strong liquor, and need not leave in the gas more than (say) 30 grains of ammonia per 100 c.ft. of gas. This is dealt with in a sulphuric acid catch, the incompletely neutralized liquor from which can go to the saturator of the sulphate plant. Not only is the working of the sulphate plant rendered more efficient and economical by reason of the higher strength of the ammoniacal liquor obtained, but the volume of the effluent is reduced by something like 20 p.ct., as is shown by tables in the appendix.

It is said that experience has shown that no subsequent trouble need be caused at the purifiers by the use of this method, if provision be made to by-pass a little ammonia to the purifiers as occasion may require.

DISPOSAL OF AMMONIA PLANT EFFLUENT.

The next point touched upon in the report is the disposal of ammonia plant effluent, as to which Dr. Bailey says: Managers of works where trouble is experienced in the disposal of ammonia plant effluent will be well advised to consider the question of running-away the effluent continuously throughout the year at a properly regulated rate, instead of running it intermittently, direct from the ammonia plant, at such times as this plant is operating. It is not, perhaps, sufficiently realized that sudden changes of the oxygen-absorbing value of a sewage may have an even greater detrimental effect on the bacteria at the sewage works than has a fairly strong sewage the oxygen-absorbing value of which remains constant. By installing storage tanks for the effluent, it is a comparatively simple matter to run-off continuously in such a way that there shall be no great fluctuation in the character of the general sewage received at the sewage treatment works. It may be necessary, in addition, so to work the ammonia plant that periods of idleness of this plant are of much shorter duration than has been the custom. Such means have actually been adopted at a number of gas-works, with the result that difficulties between the gas-works and the sewage authorities have been overcome.

TAR WORKS.

Managers of tar works are urged by Dr. Bailey to use every care to ensure that all possible is done to obviate nuisance, not only from the tail gases of distillation and from pitch fumes, but from all sources. Pyridine has often been a subject of complaint in the past; and it is hoped that, with the inclusion of pyridine in the schedule of works coming within the Act, nuisance from this source will largely disappear.

One complaint recently made against a tar works is noted. Attention was drawn to the fact that there was a considerable

deposit of tarry matter on neighbouring properties. The origin of this deposit proved to be an exceedingly small perforation in the top of the tar delivery main to the storage tanks; the result being that when pumping was in progress a very fine spray of tar was forced out, and in this condition was capable of being wind-borne for some distance.

MR. F. NAPIER SUTTON.

In conclusion, Dr. Bailey records with great regret the fact that Mr. F. Napier Sutton, F.I.C., retired on superannuation on Dec. 21. After acting as Chief Inspector's Assistant for nearly seven years, he was appointed Sub-Inspector in 1892 and Inspector in 1908; so that he carried out the duties of inspection under the Alkali Act for 35 years, during the whole of which period he remained in the South-Eastern District. Mr. Napier Sutton's work was "throughout characterized by firmness, combined with courtesy and tact, and it was done with remarkable efficiency. He was a stimulating colleague, such as one does not care to lose." Mr. Napier Sutton has been replaced by Mr. W. A. Damon, B.Sc., F.I.C., who during the past six-and-a-half years has been responsible for the work of the South and East Lancashire and North Wales District, to which district Mr. H. G. Howson, B.Sc., has recently been appointed.

Ammonia Products Manufactured in 1927 *(expressed as Sulphate,* $25\frac{3}{4}$ *p.ct.* NH_3*)—Tons.*

From Liquor Produced in—	1927.	1926.	1925.
Gas-works	147,162	132,477	148,945
Other works (including coke-ovens, iron-works, producer gas, synthetic, &c.)	252,425	132,215	201,667
Total	399,587	264,692	350,612

NOTE.—Of the total quantity of ammonia products, the equivalent of 36,667 tons was manufactured as concentrated ammoniacal liquor; the balance of 362,920 tons consisted of other ammonia products (sulphate, chloride, nitrate, &c.).

Tar Products Manufactured in 1927.

—	Gas and Coke Oven Works.	Other Works.
	Tons.	Tons.
Tar distilled	1,567,072	12,146
Pitch produced	432,653	5,823

There was unfortunately a mistake in the corresponding figures contained in the report for 1926, and reproduced in the "JOURNAL" twelve months ago. The correct figures are:

Tar Products Manufactured in 1926.

—	Gas and Coke Oven Works.	Other Works.
	Tons.	Tons.
Tar distilled	1,157,523	6,647
Pitch produced	310,634	2,360

Report for Scotland.

The report of Mr. J. W. Young to the Scottish Board of Health states that the number of works registered in Scotland was 147.

Ammonia Products, Tar Distilled, and Pitch Produced.

—	Salts of Ammonia.	Tar Distilled.	Pitch Produced.
	Tons.	Tons.	Tons.
From gas-works	19,764	122,922	29,638
,, iron-works	3,765	51,910	25,237
,, coke ovens	7,868	17,095	7,949
,, producer gas and bone works	5,904	8,124	5,328
,, shale-works	36,557	—	—
Total, 1927	73,858	200,051	68,152
In 1926	58,800	153,630	35,394

The ammonia is expressed as pure sulphate: 2577 tons were obtained as concentrated liquor ammonia and 244 tons as ammonium chloride. About 80,000 tons of tar were dehydrated and partially distilled for road purposes.

DRYING SULPHATE.

After remarking that to satisfy increased local demand for pure liquid ammonia its production has increased threefold, Mr. Young makes the following comments upon the drying of salt: In the large sulphate house, attached to the Auchengeich colliery and coke ovens, recovered salt is partly dried by whirling in centrifuges, and is neutralized, as is now general. The atmosphere within the house was, as usual, saturated with moist vapour and impregnated with pyridine evolved by neutralization. These trying conditions were unhealthy for the attendants and adverse also to the method of final drying in use—a deep fall through the air, in loose shower, of the sieved salt. The manager cut a large hole high up in each gable wall of the house. One hole he left open; at the other hole, at the opposite end of the house, and in corresponding position, he built-in a large fan, motor driven, continuous running, and of greenheart timber to preclude corrosion. The change is remarkable. The manager has obtained all the advantages that he desired. The atmosphere now is cool, dry, and odourless, to the comfort of the attendants and improved drying of salt. The true principles of drying are still imperfectly understood and practised. Expensive and elaborate machines, ingeniously designed, as if their purpose were to overheat the salt and grind its crystals to fine powder, are too numerous. Only few appreciate the fundamental need—abundance of air low in humidity and of moderate temperature. The best drying units in Scotland are simple and of home construction.

TAR WORKS.

Comparing the statistics with those for 1926, it is seen that in the past year from gas-works 8 p.ct. less tar was distilled, but from iron-works the increase was 365 p.ct., and from coke ovens and producer gas each 152 p.ct. Endurance of stills seems to have diminished; and more failures than usual have been observed. At a coke oven works it has been discovered how greatly the ash of pitch is lowered after thorough cleansing of the tank in which crude tar had been stored for many years.

BRITISH ROAD TAR ASSOCIATION EXHIBIT.

The accompanying photograph is of the stand of the British Road Tar Association at the recently concluded Quarrying Plant and Machinery Exhibition in Blackpool. The stand occupied a prominent position at the exhibition, and took the form of an information bureau.

Samples of No. 1 and No. 2 Road Board tar, and British aggregates—in tarred and untarred states—were on view, as well as sections taken from tarmacadam roads. By way of contrast, a section of the old Roman Watling Street was to be seen; and this, together with the scientific instruments used in connection with the testing of tar, and photographs illustrating the value of all-British materials for road construction purposes, was a source of much interest to the many persons visiting the exhibit.

Superannuation of Officials.

From published reports, it would appear that Mr. Alfred Dryland, the new President of the Institution of Municipal and County Engineers, is of opinion that the great majority of public officials, by the time they reach pensionable age, are worked or worried into such a condition that they seldom live long. Besides this, they have been so used to hard work that they soon fade away when the pressure is taken off. If this be the case, it naturally follows that the liability of councils in guaranteeing pensions to their officials must be a negligible one. But is it so? Mr. A. Levine, President of the Institute of Actuaries, has expressed, through the correspondence columns of "The Times," a desire for the early publication of statistics on which Mr. Dryland's deductions have been based. Should these be forthcoming, it is to be hoped that public officials will be able to derive more comfort from them than the President of the Institution of Municipal and County Engineers has been able to do. If, however, that should prove impossible, what can be done? Work and worry cannot be dissociated from a busy world; but it should be possible to do something to lessen this asserted liability to fade away rapidly when the pressure is taken off. Might one suggest to the Institution of Municipal and County Engineers the advisability of impressing upon their members the need for cultivating, while still in active work, some hobby or hobbies the following of which will, when the time for retirement arrives, serve to keep them both mentally and physically active?

STATUTORY INSPECTORS OF GAS METERS.

Annual Conference in Birmingham.

The Association of Statutory Inspectors of Gas Meters held their annual conference in Birmingham—this being the first official visit of the Association to that city—last week. The general meeting was held on Wednesday in the Council Chamber, under the chairmanship of Mr. CORNELIUS CHAMBERS, of Birmingham, the President of the Association. The company included the following members of the Executive Committee: Messrs. G. Hume (City of London), Chairman; W. Gordon (Edinburgh), F. Colburn (Birmingham), A. Winterbottom (Manchester), W. Kenyon (Sheffield), E. M. Foster (Exeter), F. Coe (Nottingham), W. Templeton (Leeds), Secretary; and L. Barry (London), Treasurer.

Mr. H. N. Barrow, of Manchester, Chairman of the Manchester Justices' Gas Meter Inspection Committee, was elected President in succession to Mr. Cornelius Chambers, who was cordially thanked for his public-spirited services in that office during the past year.

WELCOME TO BIRMINGHAM.

In his address of welcome to the delegates to Birmingham, Mr. CORNELIUS CHAMBERS said it was peculiarly fitting that the gas meter inspectors should hold their conference in that city, because it was within its boundary that the industry of gas-making originated. William Murdoch erected a plant at the works of Messrs. Boulton & Watt, Soho, for illuminating their buildings. These works were taken over by Messrs. W. & T. Avery, who had invited them to pay a visit there. About 1817, a small gas-works was erected in a street off Broad Street, still known by the appropriate name of "Gas Street," by a Mr. John Gosling, who agreed to supply coal gas to various consumers for lighting purposes, at a price per burner. This was, of course, prior to the invention by Clegg of the gas meter. The business was converted into a company in 1819; and subsequently a second company was established in 1825, for a supply of gas to Birmingham and surrounding districts. The interests of both companies were taken over by the Birmingham Corporation in 1875. The late Joseph Chamberlain was Mayor at the time; and it was his foresight and grasp of the potentialities of gas that brought about the purchase. To-day the Birmingham gas undertaking was the largest provincial concern of its kind, and was looked upon as a pioneer in the gas industry. The number of consumers in the Birmingham area of supply was 232,000. Consequently there was that number of meters—130,000 being prepayment. Of the Birmingham output, 30 p.ct. was used for industrial purposes. The testing of gas meters was never more important than it was to-day, owing to the enormous number of cookers, fires, &c. Meters had increased their capacity so that they were passing much larger quantities of gas than they did previously. When they thought of the millions of pounds paid annually for gas, and that the meter was the only auditor of the accounts, they realized the importance of the testing stations throughout the country. The competition of electricity had become very keen; but if there was any rivalry between the electricity and the gas industries, it should be of a friendly character, for there was ample room for both. Gas played an important part in manufacture and in domestic and social life, and they could look forward to a long continuance of its use. The developments taking place in electricity, and schemes for the reorganization of the electric supply undertakings, would, he believed, be an incentive to gas engineers to keep pace with such growth. It might be a wise step, and would give satisfaction to consumers, if electric meters had to pass an official test as was the case with gas meters.

ANNUAL REPORT.

In the Council's annual report (which was approved) it was pointed out that the current period was one of change and development in the production of the gas meter. This opened up the question whether the present requirements as laid down provided adequate safeguards for dealing with the new types of meter. The Council had had under consideration the correct interpretation of section 12 of the Sales of Gas Act, 1859, in conjunction with section 19 of the Gas Regulation Act, with regard to whether an inspector was in a position to refuse to accept a meter of a new pattern, or containing new or novel features, until such meter had been submitted to the Board of Trade, and a certificate issued. It would appear that the opinion of the Board of Trade was that an inspector could not refuse to accept a meter in these circumstances, and that he was not in a position to say he would not deal with the meter until it had received a certificate from the Board. He must accept any type of meter submitted; and if it complied with all the statutory requirements, it must be stamped. The Council considered that this was a matter which should be placed clearly before all members, as it would appear that section 19 of the Gas Regulation Act, which was included in the Act for a specific purpose, was apparently valueless. Another matter which the Council was invited to consider was whether or not an inspector had power under section 12 of the Sales of Gas Act to reject a meter which, upon being tried for backstop action, passed gas without registration by reason of the weight of metal in the valve cover being insufficient to withstand 2 in. pressure.

A resolution (proposed by Mr. HUME, London) was carried requesting the Council to consider the advisability of approaching the Board of Trade with a view to obtaining for gas-meter inspectors the same facilities in regard to meters containing the novel features as are enjoyed by weights and measures inspectors.

A vote of thanks to the Officers and Executive Committee was passed.

WORKING AND EQUIPMENT OF THE BIRMINGHAM JUSTICES' GAS METER TESTING STATION.

By FREDERICK COLBURN, Chief Inspector of the Station.

In Birmingham, by reason of the fact that the City Council own the gas undertaking, the responsibility of the administration of the Gas Measures Acts devolves upon the City Justices as the independent local authority.

The original testing station was established in the Public Offices, Moor Street, upon the adoption of the old Sales of Gas Act, 1859, and the present premises in Sheep Street were built and opened in 1897. In 1920, upon the introduction of the Gas Meter Regulations, considerable alterations and additions were made to these premises to accommodate additional plant required to cope with the increasing demands upon the Department.

The following comparative figures of the returns of this office give an indication of the large growth of the post-war gas meter industry in this district:

Year.	Meters Tested.
1900	22,566
1910	47,695
1914	65,455
1920	68,075
1924	126,770
1928	106,209

EQUIPMENT.

The equipment of the Department at present consists of:

Fourteen	11	c.ft.	standard	test holders
Six	5½	"	"	" "
One	100-light		"	" meter
One	20	"	"	" "

together with the necessary testing tables and auxiliary instruments. Each table is equipped with one leakage meter, used to apply the external and internal soundness tests; also one King's pressure gauge, connected to show either inlet or outlet pressure of the meters under test. The feature of the fitting of the holders, leakage meter, and pressure gauge to the table is such that, while two or four meters are undergoing the soundness tests through the leakage meter, two others, which have previously passed those tests, can be tested for registration simultaneously by the holders, thus reserving the latter for registration tests only.

Air is used as the testing medium, each holder being connected to a 3-in. main service, and each leakage meter to a ¾-in. service; both services connecting with a 12-in. Gunther blowing fan, belt-driven by a 1-H.P. electric motor, which maintains an air pressure equal to 5-in. W.G. Any variation due to an increase or a decrease of voltage at the motor is readily adjusted by a shunt rheostat situated in the test room. Gas is connected to the tables, but is used only to locate leakages in meters or fittings.

The water employed in the testing of wet meters is supplied to the tables from a tank of 800 gallons capacity. The tank is filled overnight, and before use acquires the room temperature. When necessary, the temperature of the water can be raised by mixing with hot water supplied from a geyser.

The test room is heated by low-pressure hot water pipes, and the air in the room is changed by the constant rotation of an Archimedean ventilator fitted in the roof. For the regulation of the room temperature, two electric fans have been fitted in the roof, one at each end; and, with a view to obtaining the maximum natural light in the room, three roof lights with a northern aspect were inserted.

EXAMINATION AND VERIFICATION.

The meters as received are distributed to the several tables, and not until then are they examined to see whether they comply with sections 11 to 18 of the Regulations. If not, the deficiency is noted, and the tests for verification are proceeded with, though the meters are subsequently rejected. First the meters are submitted to the external soundness test singly, and to the internal soundness test in pairs, or singly, through

the leakage meter at 5-in. pressure. Should the meter fail to withstand either tests for soundness, it is rejected. Upon proving sound, the meter is disconnected from the leakage meter and connected to the holder. The outlet from the holder is carried over the testing tables by the usual 2-in. swan-neck bends reduced down by flexible tubing ending in a 1-in. hose union, and each table is supplied with a full set of interchangeable conical brass connections to fit the hose union and the inlet and outlet of the various size meters. For meters requiring a very large rate of flow, a floor base is used connected to a full 2-in. supply.

The outlet from the meters is controlled by a quadrant cock, and from immediately below this cock a connection is made to the pressure gauge which enables the operator to take readings of the absorption of pressure of the meters under test during the course of the registration tests, in accordance with section 22 of the Regulations. From the distribution engineer's point of view, this test is only of secondary importance to the registration test, and, I believe, was primarily intended to keep down the loss in the new increased capacity meters. From my experience, I find that more meters of the old light rating are rejected under this section than of those of the high capacity type.

During the past year, out of a total of 106,209 meters tested at the Birmingham Office, 164 were rejected for excessive absorption of pressure, or approximately 1·5 per 1000. The Act allows a tolerance loss of five-tenths, which, in view of the above figures, is ample; but to determine accurately whether meters come within this tolerance at their badged rate, great care is necessary.

For the guidance of Inspectors, the Board of Trade issued a supplementary memo. to Regulation 22, which states:

> Unless gauges are fitted strictly on the inlet and outlet of the meter—*e.g.*, on the inlet and outlet pipes of the meter itself—it is necessary to deduct from the difference in pressure indicated by the gauges any difference between the readings on the gauges when gas or air is passed at the same rate of flow through the test fittings alone with no meter present—*i.e.*, when the inlet or outlet connections of the testing apparatus are joined together through a dummy box having similar inlet and outlet to those on the meter, but without having any internal mechanism. For any particular testing plant the amounts of these allowances may be tabulated for the various fittings and for the rates of flow corresponding to the measuring capacities of the various meters tested.

To determine the exact loss of pressure due to test fittings alone, several factors must be taken into consideration, apart from the "same rate of flow," such as a slightly greater length of pipe connection or an extra elbow as between (say) a right or left hand holder. Conical slip-in connections, which are obviously not similar in size to the inlet and outlet connections of the meter, give a flow much greater than the rate per hour required. To register the lowest fittings loss, the outlet cone must be equal to, or larger than, the inlet cone, and in any case it is essential that the largest cone possible should be used.

Personally, I use the conical connection for reasons of ease of manipulation and economy of time, and prefer to check test the fittings loss immediately after a meter is queried for excessive absorption of pressure. This is a simple and quick operation, requiring only the insertion of a small piece of tubing between the inlet and the outlet cones, instead of the meter.

The following table indicates the difference in fittings loss when using various size cones at the different rates of flow:

Size of Inlet Cone.	Rate per Hour.	Size of Outlet Cone.	Rate per Hour.	Speed Checked to.	Fittings Loss—Tenths.	
					Air.	Gas.
In.		In.		C.Ft.		
½	160	½	160	80	4·25	3·75
¾	300	¾	160	80	3·75	2·25
¾	420	¾	160	80	3·25	2
¾	300	¾	300	80	2	1·5
¾	420	¾	420	120	2·75	2
¾	420	¾	300	120	4	2·75
Without cones				50	0·25	..
				80	0·5	..
				120	1·25	..

No two installations tally exactly one with the other under apparently identical conditions; and, as will be seen from the above figures, the varying combinations of connections, at different rates, may conceivably make the difference between a meter being stamped or rejected. In no case, at the Birmingham Office, is a meter rejected for loss of pressure without a confirmatory test. With the same tests as with air, duplicated with gas, the difference is such that a meter which comes within the absorption of pressure allowance when tested with air is definitely within the allowance when used with gas. When making the above tests, the outlet aperture needed slight adjustment to correct to the desired rate of flow according to the inlet volume passed through the various size cones.

Oscillation.

Section 21 of the Regulations states that, should a meter during either tests for registration cause undue oscillation of lights, it shall not be stamped; but it omits to define what is "undue oscillation." There are very few meters of ordinary manufacture which do not show a variation of 0·05 up to 0·1 in. on the pressure gauge during the run of the test for registration; and the point arises, What amount of oscillation over and above that amount constitutes undue oscillation? Personally, I assume any meter to be unduly oscillating which shows a drop in pressure as indicated by the gauge exceeding the amount of five-tenths at any recurring point of each revolution of the meter. In practice, undue oscillation and excessive absorption of pressure are definitions of the same cause for rejection.

In the foregoing remarks I have endeavoured to put before you, to the best of my ability, what I conceive to be an impartial practical interpretation of section 22 of the Gas Meter Regulations. It is, no doubt, a point upon which, with an exchange of notes of experience, we can materially assist each other to attain uniformity of procedure.

Civic Hospitality.

The Lord Mayor of Birmingham (Alderman A. H. James) entertained the members of the conference at lunch; the company including Alderman J. H. Lloyd (Chairman of the Birmingham Corporation Gas Committee) and various public officials, among whom were Messrs. A. W. Smith, R. J. Rogers, and John Foster, of the Birmingham Gas Department.

The MAYOR, proposing the toast of the Association, said the fact that, out of 230,000 gas meters examined in Birmingham, only 3 p.ct. were rejected was a tribute to the manufacturers.

The PRESIDENT, in reply, observed that the accuracy with which gas meters worked was proved by the small number of rejections out of thousands manufactured.

In the afternoon the members visited Bournville, and inspected the works of Messrs. Cadbury Bros.

On Thursday a visit was paid to the Birmingham Justices' Gas Meter Testing Station, and the remainder of the day was devoted to a motor trip to Stratford-on-Avon, with calls at Kenilworth and Warwick.

The programme of a successful annual meeting concluded on Friday with a visit to the works of Messrs. W. & T. Avery, Ltd., at Soho, Birmingham.

Luncheon at Stratford.

The delegates were entertained at luncheon at Stratford-on-Avon by Messrs. Parkinson and W. & B. Cowan, Ltd., the Sutherland Meter Company, Ltd., Messrs. Thos. Glover & Co., Ltd., Messrs. A. G. Sutherland, Ltd., Messrs. J. & J. Taunton, Ltd., and the Vulcan Meter Company.

Mr. CORNELIUS CHAMBERS, in submitting the toast of "Our Hosts," pointed out that all these firms were represented at the luncheon; and it was by their courtesy and kindness that the Association were visiting Stratford. Their inspectors came, he said, into close contact with the manufacturers in their official capacity, and it was gratifying to know that there was a very friendly feeling existing between them. He was sure the manufacturers must recognize that the inspectors were endeavouring in every way not to hinder, but to assist, them. They had important duties to carry out; and they were undertaking them in an impartial manner. It spoke volumes for the care, the workmanship, and the supervision which the meters were receiving, that when they were sent to the testing station there were so few rejects. The manufacturers were continually bringing out improvements; and they could rely on the skill of their hosts and all the gas concerns to develop the use of gas in every possible way. It was the wish of the inspectors that the gas undertakings should prosper; and it was their earnest wish that the gas meter manufacturers might share in that prosperity.

Mr. E. D. WEIPPERT (Messrs. Parkinson and W. & B. Cowan, Ltd.) replied on behalf of the six firms who had works in Birmingham. He observed that, while Birmingham was a pioneer in the gas industry, a similar claim could not be made in relation to the gas meter industry. Meters were manufactured in London and Edinburgh before they were made in Birmingham; but they had been made in the latter city for nearly a century, and it was to-day one of the recognized centres of the industry. Only recently he had in his hands a meter over ninety years old. Though meters were in such general use in the country, it was a curious fact that the gas meter was still largely a mystery to the average citizen, who frequently regarded it with distrust. Members of the Association helped to reassure the public that the gas meter was really a reliable machine. Mr. Weippert testified to the harmonious relations existing between gas meter manufacturers and the statutory inspectors.

The toast of "The Association of Statutory Inspectors of Gas Meters" was proposed by Mr. R. P. TAUNTON (Messrs. J. & J. Taunton, Ltd.) He had only had the honour, he said, of having been in the gas meter industry for a few years, but he often wished he had been born into it, because his relations with the people in the gas industry had been so congenial.

Mr. R. J. ROGERS (Superintendent of the Fittings Department, Birmingham Gas Department), supporting the toast, observed that he had followed the happenings of the Association of Statutory Inspectors of Gas Meters from its very inception. All engaged in the gas industry realized that there was need for such an Association. There was no doubt that the Association, with the facilities it afforded for the interchange of ideas and experiences, was very helpful to the gas

industry. Mr. Rogers referred to a point which exercised the minds of the inspectors—the increased capacity demanded of gas meters. He remarked that several speakers had mentioned the fact that most gas was used for heating purposes. For heating and power they required much larger volumes of gas than for lighting purposes; and it seemed they were somewhat behind the times when they accepted a meter stamped by the inspectors as registering 30 c.ft. per hour, knowing full well that the meter would be called upon to register up to 120 c.ft. per hour. What the precise amount was at which these meters should be stamped was a debatable point. He hoped they would take that matter into consideration in collaboration with the makers and buyers of meters in the near future, with a view to looking at the whole question and deciding what should be the right capacity of gas meters in various sized cases. As a representative of the Birmingham Gas Department, the speaker paid a tribute to the courtesy of the meter inspectors. Mr. Colburn, as their Chief Inspector, did not let them down lightly when the occasion arose, but at the same time he always endeavoured to meet them in a most cordial manner and in a spirit of co-operation. He (the speaker) thought, if they looked through the statistical records of the gas industry for all the large centres and the small towns, they would find the use of gas was on the increase. It was what they all desired. He was sure that if the gas industry was left alone, unhampered by arbitrary restrictions, and if it was given a fair field, it would continue to expand. He coupled with the toast the name of the esteemed Chairman of the Executive Committee, Mr. Hume.

Mr. GEO. HUME (London), in the course of his reply, observed that the manufacturers and inspectors had a common purpose—to see that the gas companies were supplied with efficient instruments, and that the gas consumers were well protected. The gas consumer had good reason to be content with his meter.

Mr. H. N. BARROW, J.P. (Manchester), submitting "The Chairman," paid a high tribute to Mr. Chambers' ability; and Mr. CHAMBERS briefly replied.

THE PRODUCTION OF SMOKELESS DOMESTIC FUEL.—III.

By JOHN ROBERTS, D.I.C., M.I.Min.E., F.G.S., Author of "Coal Carbonization: High and Low Temperature.'

(*Continued from p.* 43.)

OXIDIZING PROCESSES.

It was demonstrated by De Marsilly, in 1857, that the coking properties of coals could be destroyed by heating them in the presence of air at a temperature of about 300° C. The experiments were repeated by Percy, who noted also that a strongly-coking Newcastle coal could be heated at 300°-304° C. in a hot-air bath for about a quarter-of-an-hour without sensibly losing its property of coking and swelling; but if kept at that temperature for an hour or two, it would not swell when subsequently heated, and would yield only a very slightly fritted coke. These observations, though of great importance, as recent developments proved, led to no changes in the method of carbonization then in vogue. Strangely enough, another important discovery was made about the same time (1859) by Souquière, who found that the use of coke breeze mixed with coking coal increased the density of the coke and eliminated sponginess, while hastening the carbonizing process. The records of these two discoveries remained as needles in haystacks for over sixty years. One of the chief reasons why they were not put to practical use at the time was that the problem of carbonizing coal at low temperature had not arisen; and it was not until 1920 that it was definitely proposed to apply these principles in a systematic manner in low-temperature carbonization, although Parr and Olin carried out experiments on coke-breeze blending in 1912.

AN ACCIDENTAL DISCOVERY.

The writer has stated elsewhere the reasons that led him to resort to blending coke breeze with coal. It arose from an observation of the difference in behaviour of a "faulted" coal, as compared with the same coal from undisturbed ground. While following this avenue of research, it was accidentally observed that oxidation produced somewhat similar results. In drying a quantity of about 2 kilos of coal in an air bath, the mass became overheated through an oversight; but its temperature was noted. In blending coke with the overheated coal, the results proved unsatisfactory, and it was found that the coal would no longer stand mixing with inert. In fact, it would not swell during coking, and was now in the right condition for carbonization. The temperature attained by the coal in question was 175° C.; but it was not possible to say how long the coal had been exposed to this temperature. Repeating the work, it was found that a South Yorkshire coking coal, ground to pass a 30-mesh sieve, required to be heated at 150° C. in the presence of air for about one hour; and it was then properly conditioned. Coals having more strongly-coking properties required longer treatment, as did coals of coarser mesh. It was noted that the plastic layer did not develop in coals thus treated, the cokes produced were particularly homogeneous, and again it was found that heat penetration was improved, as a result of the elimination of the plastic layer. A coke from an oxidized coal prepared in this manner was illustrated in a paper published by the writer in 1921; and further reference to the subject was made in a paper in the following year, in which it was shown that with a given coal, by controlling the heat-treatment, cokes of varying characteristics could be obtained.

ADVANTAGES OF PRE-HEATING.

It was at first objected that pre-heating the coal involved two-stage carbonization, and consequently would add to the cost of treatment, on account of both the handling of the material and the expenditure of energy. Although a simpler system was shortly afterwards evolved, it must be borne in mind that many advantages follow pre-heating. In the first place, very little volatile matter is expelled up to 300° C.; but a considerable amount of water, both hygroscopic moisture and water of constitution, is driven off. If the whole of this water was evaporated at (say) 600° C., a useless expenditure of energy would result from raising the temperature of the water to a degree considerably higher than that at which it is evolved, which water has to be later condensed. It is common practice to carbonize wet coals in this manner; and at high temperatures greater waste of energy takes place, as in coking and gas-works practice. The disadvantage of two-stage operation is minimized if the coal is passed while still hot into the secondary chamber. Further, owing to the improvement in heat penetration already mentioned, a further saving of heat energy is effected. On balance, therefore, it is only to be expected that this two-stage process would result in a net decrease in the coking period, as proves to be the case. Finally, where no inert material is available for blending, pre-heating may be the only alternative, in the absence of retorts designed specially to overcome swelling of the coal.

In spite of the advantages mentioned, it must not be overlooked that pre-heating the coal results in the destruction or partial destruction of the binder of coking coals; and as the supply of the latter is limited, it is economically more advantageous to utilize the binder of strongly-coking coals to bind, or cement, inert material such as high-volatile and anthracitic non-coking coals.

PARR AND LAYNG PROCESS.

It has been explained that partial distillation processes involve distilling the coal in the absence of air at temperatures of about 450° C. The oxidation process demands the presence of oxygen; and temperatures do not reach the decomposition temperature of the coal—namely, about 300° C. An intermediate process was described by Parr and Layng in 1927, in which they proposed that the pre-heating should take place at a temperature below the decomposition temperature (300° C.), but in the absence of air. The coal is first passed through a rotating drum externally heated by the waste heat from the flues surrounding the coking retorts. The time taken in this part of the process varies from 15 minutes to 2 hours; and the temperature is controlled so that it is within about 25° to 50° C. of the temperature at which the coal becomes pasty. The second stage consists in passing the pre-heated coal while hot into the carbonizing chamber, which is heated at temperatures up to 750° C.

It will be observed that there is little to choose between the oxidizing process and Parr and Layng's system. Obviously, the oxidation process would be more rapid under the same temperature conditions, or for a given pre-heating period a lower temperature could be employed where the coal is being oxidized. The advantage of employing the higher temperature in this stage results from the fact that more water of constitution could be eliminated. In both cases dense, hard coke is obtained.

THE WISNER, OR "CARBOCITE," SYSTEM.

In view of what has been stated above, it may appear surprising that in 1925 a British patent (No. 217,554, Convention date 1923) was taken out by an American citizen for the treatment of coal by the oxidizing process. In this specification, Clarence B. Wisner (who must not be confused with Winser) proposes the use of apparatus for treating high-volatile coals in an oxidizing atmosphere, to prepare them in a very short time for carrying out the process of carbonization without swelling or sticking to the walls of the retort. The object is attained by crushing the coal to comparatively small pieces, and then agitating and heating it in a current of air to a temperature above steam-producing temperature, but lower than the temperature at which hydrocarbons are evolved. "The action of the heat and the air current serves to remove the free moisture, and enough of the water of formation in the coal to partially dry up the gums and resins, and to render them inert, wholly or partially, within a very short period of time; and adapts the

coal for a low-temperature carbonization process, without clogging the retort."

The Wisner, or "Carbocite," system is being employed at Canton, Ohio. The pre-heating of the coal is carried out in an inclined rotary retort termed a thermodizing chamber. This retort is 8 ft. in diameter and 125 ft. long. Crushed raw coal is fed in at one end; and a current of air heated to about 150° C. passes through the revolving chamber counter-current to the coal. The coal thus becomes oxidized, and its coking index sufficiently reduced to prevent swelling. It is then passed into rotating carbonizing retorts of the same form and dimensions as the pre-heating chamber, and is there carbonized at about 600° C. Provision is made, of course, for collecting the volatile products.

The yields of products in this system are the normal for the coals and temperatures employed, and therefore call for no comment. The smokeless fuel, which resembles "coal balls" in appearance, should possess good free-burning properties; but it appears that the proportion of fines produced reaches 20 to 25 p.ct., which is a high figure. If the aim is to manufacture the fuel for industrial purposes, this high yield of fines may not be objected to; but for domestic purposes a larger proportion of "round" coke must be obtained. The high yield of fines is accounted for by the fact that carbonization is carried out in a rotary chamber, with the charge in a state of continual motion, and consequently the process of coke formation is being interrupted by the movement of the mass. The rotary chamber is desirable for the oxidizing stage; but carbonization should be carried out under static conditions if the maximum yield of domestic fuel is required. The yield should reach 98 p.ct., and by returning to the retort the fines unavoidably produced, a yield of 100 p.ct. of marketable coke should be obtained from the coal charged. This can be accomplished in at least one other system.

THE DETERMINATION OF VOLATILE MATTER IN COKE.

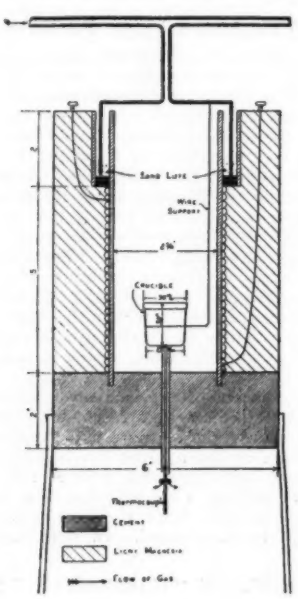
By FREDERICK JOHN EATON and STUART PEXTON.

[Reprinted from the Journal of the Chemical Society, 1928.]

During certain investigations upon the reactivity of coke it was found necessary to determine accurately the content of volatile matter. The method of the American Society of Testing Materials (1924, D, 37, 1018) and a method adapted from the Bone and Silver method for coals (J.Chem.Soc., 1921, **119**, 1145) were examined. In the former method the coke, in a platinum crucible, is heated in an electric furnace at 950° (Fieldner, U.S. Bureau of Mines, Tech. Paper No. 76), but no special precautions are taken to prevent losses in weight due to oxidation, though Fieldner (*ibid.*, p. 20) states that when the same method is used for coal, where oxidation is minimized by the presence of a reducing atmosphere in the crucible, oxidation losses amount to less than 0·3 p.ct. In the adapted Bone and Silver method, coke is heated in a silica tube filled with nitrogen until evolution of gas ceases. A disadvantage of this method is that, owing to the low conductivity of silica, the test is prolonged and the final temperature of the coke uncertain.

The following method has been found to combine the rapidity of the first method with the trustworthiness of the second.

Apparatus.—The apparatus is shown in section in fig. 1. The



platinum crucible is suspended by nichrome wire from a monel metal cap, so that when in position in the electric furnace the thermocouple junction touches the base of the crucible. Nitrogen is fed at a steady rate (200 c.c. per minute) into the furnace through a cap sealed by the sand lute, and escapes through the silica tube which carries the thermocouple.

Procedure.—1·1 grammes of the sample, ground to pass a 70-mesh sieve (I.M.M. Standard), are weighed into a small test-tube and then dried for 1 hour at 120° to 130°. After cooling in a desiccator, the coke is weighed in a tared platinum crucible protected from moisture by a porcelain lid, which is used instead of the platinum lid because the weight of the latter, when in the furnace, is affected by particles of sand falling from the lute.

Air is displaced from the furnace tube by a current of nitrogen, and the platinum crucible, closed with a tightly fitting platinum lid, is introduced into the furnace. The heating current is controlled by an external resistance so that the initial temperature of 950° ± 10° is regained after one minute. After 2 minutes the temperature should be stationary at 950° ± 2°. The temperature is recorded every 10 seconds for the remaining 5 minutes. At the end of 7 minutes the crucible is withdrawn and placed on a slab of brass (to ensure sudden cooling) in a desiccator. When cold the crucible is reweighed with the porcelain lid. The loss in weight expressed as a percentage by weight of the original coke represents the volatile matter.

If the determination is carried out as directed, the variations in the percentage obtained should not exceed ± 0·05. Particular attention must be paid to the fineness of the sample, prevention of absorption of moisture during weighing, accurate temperature control, and the brightness of the crucible.

The new method possesses the following advantages: (1) Errors due to oxidation are avoided by heating in a current of nitrogen, and it is therefore possible to obtain comparable results with cokes of different reactivities towards oxygen. (2) The temperature of heating is accurately known, since the thermocouple junction is placed close to the base of the platinum crucible. (3) The method is rapid, since the coke is heated in a platinum crucible which has a high heat transmission and low heat capacity, and the coke rapidly attains a temperature of 950°.

The following table gives examples of the results obtained for the percentage of volatile matter.

Sample.	Adapted Bone and Silver Method.		American Method.	Authors' Method.
	10 Minutes' Heating.	60 Minutes' Heating.		
A . .	1·37, 1·18, 1·30, 1·67	1·86, 1·71	3·02, 2·92, 2·76, 2·66, 2·58	1·52, 1·55, 1·58, 1·59
B* . .	1·86, 1·81	2·5, 3·12	7·84, 7·34, 7·52,	2·56, 2·5, 2·61
C . .	1·74, 1·8	2·2, 2·36	3·06, 3·04	1·98, 1·92, 1·92, 1·92
D . .	0·92, 0·94	1·63, 1·73	4·4, 4·42	1·78, 1·76
E . .	0·75	0·94, 1·08	2·8, 2·76	1·03, 1·02, 1·06, 1·03

* This sample was a specially reactive coke.

The Gas Light and Coke Company.

Collecting Flue Gas Samples.—When securing cumulative test samples of flue gases, one frequently collects them over water. Owing, however, to the solubility in water of the component gases—especially carbon dioxide—and to the effect on this action of temperature and pressure, "Power" says that this liquid should not be used to collect the sample, should accurate results be desired. If water is employed, it will absorb carbon dioxide, for example, until it becomes saturated with the gas. This results in a loss of some of the carbon dioxide that was in the gas. Then if a gas containing less carbon dioxide is collected over the same water, the water will give up carbon dioxide, and increase the carbon dioxide contents of the gas. If, instead of water, a saturated solution of sodium chloride is used, these errors will be greatly reduced, as the gas is much less soluble in this solution.

GAS EXHIBITION AT IPSWICH.

Co-Operation Between Gas Supplier and Appliance Manufacturer.

On Monday, July 2, the MAYOR OF IPSWICH (Major W. Rowley Elliston), who was accompanied by the Mayoress, opened a "Modern Home" Exhibition at the Co-operative Hall, Ipswich, which is to continue till to-morrow. As mentioned in last week's "JOURNAL," Radiation Ltd. were responsible for its organization, in which they were enthusiastically assisted by the Ipswich Gas Light Company.

MARVELLOUS PROGRESS OF GAS.

The MAYOR, in declaring the exhibition open, said that at the present time the poorest and humblest of their citizens enjoyed comforts and conveniences which emperors, kings, and queens could not have enjoyed 300 years ago. In Shakespeare's time, London was entirely without coal, and the benchers and students of the Temple and Lincoln's Inn could pick grapes and figs in their courtyards. As the centuries went on, coal had so overburdened their atmosphere with smoke and grit that London was a place of dirt and fog. But every mischief brought about its own remedy, and during the last 100 years or so the introduction of gas as a factor of lighting and heating had made a vast difference. Those who were optimistic believed that, with the greater use of gas, smoke, smuts, and grit would be things of the past, and they would enjoy clear and unimpeded sunlight in their streets and courts. Progress had been marvellous, but a great deal yet remained to be done. In that exhibition they could see the most up-to-date methods of using gas. As Mayor of the town, he was, as all ratepayers were, interested to some extent in the electrical industry, but all his life he had been a free trader, and he believed that the best results could be obtained by unrestricted competition. He would go further, and say that competition was good for everybody, and good for every industry.

At this point, the Mayoress was handed a handsome bouquet of pink and white carnations by Miss Pamela Garrard, daughter of the Gas Sales Superintendent of the Ipswich Gas Company.

Dr. H. H. BROWN proposed a vote of thanks to the Mayor and Mayoress; and Mr. F. W. GOODENOUGH, C.B.E., in seconding, observed that since gas had entered the home, woman had enjoyed much more leisure. Gas made it possible for her to "feed the brute" with greater ease, more certainty, and less drudgery; it enabled her to have hot water for all her washing-up and baths, and to provide comfort in the matter of warm rooms.

THE DISEASES OF DARKNESS.

Dr. SALEEBY, in a short address, pointed to the fact that the passing of the Public Health Act of 1875 had practically eradicated water-borne diseases; and it was up to them to turn their attention to what he would call the diseases of darkness. The prince of the powers of darkness was tuberculosis, and that, with its fellows, he claimed, was an entirely preventable disease which could be stopped by air and light. If their air could be kept as pure as their water was now kept, they could secure the full benefit of the light of life, natural sunlight, which had served their ancestors so well in the past.

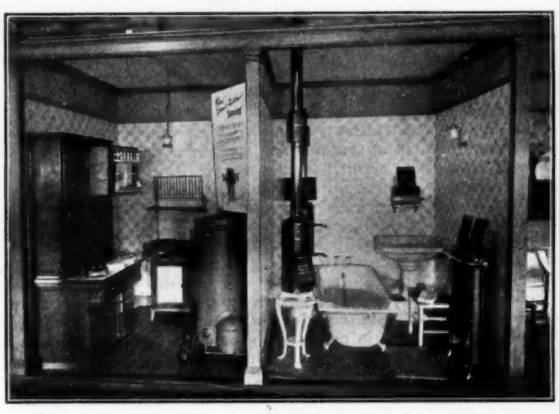
LUNCHEON.

Prior to the opening of the exhibition, the Directors of the Ipswich Gas Light Company entertained a number of visitors at lunch in their offices. Mr. P. W. Cobbold presided, in the absence of the Chairman of the Company, Mr. Henry Woodall.

The Loyal Toast having been duly honoured,

Mr. THOMAS GLOVER, formerly Lord Mayor of Norwich, proposed the toast of the Ipswich Gas Company. He explained that the duty should have been performed by Sir Albert Ball, but that gentleman had wired that an accident to his car prevented his attendance. The Ipswich Company, Mr. Glover said, was a live one, and a very good neighbour. The Company had been among the first to grasp the importance of the prepayment meter, and to introduce the gas cooker.

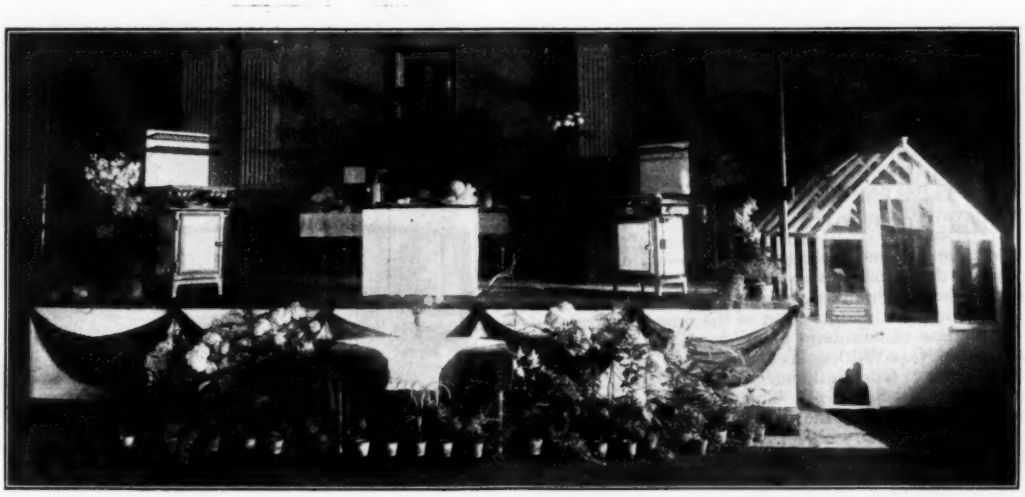
The CHAIRMAN, in responding, apologized for the absence of Mr. Woodall, and extended a hearty welcome to all the visitors. He was the youngest of the Directors, but ever since he had been on the Board he had found the Company very much alive to the problems of the times. It had recently taken to itself a new infant, the Woodbridge undertaking, which he hoped would grow up to be profitable, not only to the Company, but to the inhabitants of the district in which it was administered. The Ipswich Company was alive to the interests not only of its consumers, but also of workmen and staff. They had a very good pensions scheme and a capital co-partnership scheme, and he thought he could say without fear of contradiction that their staff and workmen were as contented as any in the country. [Applause.] They realized that, to sell their commodity efficiently, they must have good apparatus for its use; and he thought the exhibition would show that gas was as good as electricity for most purposes. They had very serious and keen competition in the electricity industry, which did not seem likely to grow less; but, speaking for the Ipswich Company, he could say they were not afraid of competition so long as that competition was not unduly loaded against them.



Two of the series of Model Rooms displayed along one side of the Hall.

Mr. FRANK PRENTICE gave the toast of "The Visitors." Rightly or wrongly, he said, they in the gas industry believed they held the key to the smoke problem, and they would endeavour to uphold that fact wherever opportunity was vouchsafed them.

The MAYOR, in responding, remarked that, though the Corporation was connected with a big electricity undertaking, he felt bound to



THE STAGE SET FOR COOKERY DEMONSTRATIONS AND LECTURES.

The model greenhouse is warmed by a "Daisy" heater.

look with a benevolent eye on the gas undertaking, because it supplied a definite need. He was one of those who thought that competition was the beginning of all sound progress.

VALUE OF GAS FIRES.

Mr. GOODENOUGH, who also replied, said that the gas industry had not the slightest fear that electricity would wipe out gas in the near future, as some people were so fond of suggesting. As the Mayor had said, there was undoubtedly room for both enterprises, and it might surprise some people to know that the gas industry was developing at the present moment more rapidly and more surely than ever before in its history. When he told them that the increase in the output of gas in the British Isles during the past year represented fully 100 times the amount of energy supplied from the Ipswich Electricity Works during the same period, they would get some idea that the gas industry was not on its last legs. There was a field for both, but that did not mean that they were called to occupy the same field in public service. They believed that in the field of fuel gas was easily supreme. He believed, not merely from theory, but from practical experience, that electricity, at any price at which it could be supplied in this country, where it had to be generated from coal, could never compete with gas in the field of fuel. They believed, moreover, that electricity could not compare in the field of health with gas heating, which in addition to warming a room effectively ventilated it. No other form of heating, except the coal fire, could perform that dual and most important service. Steam heating, closed stove heating, and electricity only churned up the air in the room without changing the atmosphere; and when they remembered this they could not be surprised that the greatest consumption of gas in a residential area in London was in the district of the medical profession round about Harley Street. In view of this, they could feel certain that the field of gas for heating was not likely to be invaded seriously, either now or in the years to come, by any system of heating that did not combine with it ventilation. It was the convincing fact that doctors were users of gas fires, not only in their consulting rooms, but in their own living rooms, bedrooms, and nurseries, which had led in recent years to the increase in the use of gas fires—a far bigger increase than in any other similar period before. He believed that the future of gas was brighter to-day than ever; he believed that the future of electricity was brighter than ever; he believed there was ample room for both; but he thought it was a pity that any man engaged in public life should, for political reasons, belittle the gas industry in order to magnify electrical enterprises to which they had given their backing. Mr. Prentice had told them that the gas industry held the key to the smoke problem; he agreed, but would prefer to say it held the keys—namely, gas and coke. They were already solving the smoke problem, for the atmosphere of the cities was far different now from what it was twenty-five or thirty years ago—immensely different from what it would be if coal were used in place of the hundreds of thousands of gas cookers and gas fires; and they were proud of the part they had played. [Applause.] As the output of gas had gone up, the death rate had gone down; and, while he would not be so foolish as to say that the one was the sole cause of the other, it had been a real contributing cause, co-operating with other movements of progress in hygiene and public health. It had also contributed to the happiness of the nation, because everyone who worked under a bright sky and in clear air must be happier than under the smoke palls of any fog.

RADIATION APPLIANCES SHOWN AT THE EXHIBITION.

John Wright & Co.—"Eureka New World" gas range, and examples of "New World" cookers in mottled enamel finishes. "Classic" gas grates; "St. Bernard" radiators; "Sunhot" and "B.T.U." boilers; "Viking" wash-boiler in mottled enamel, and the "Eureka" gas iron set.

The Richmond Gas Stove and Meter Company, Ltd.—"Bungalow New World" gas range and a selection of "Bungalow New World" cookers. The Richmond "Silent" gas grates. A demonstration greenhouse equipped with the "Daisy" heater; the "Richmond" geyser and "Lyn" boiler, and also the "Hollar" boiler, and examples of this firm's hot water specialities. In addition, an enamelled wash-boiler and gas-heated iron.

The Davis Gas Stove Company, Ltd.—The "Alpine New World" hot-top gas range and "Alpine New World" cookers. Four gas grates in special copper and pewter finishes. One garage radiator and a Davis "Shamrock" geyser. A coke boiler and an interesting flue-block exhibit. A mottled enamelled wash-boiler and a gas iron.

Fletcher Russell & Co., Ltd.—"Kingsway New World" cookers and "Historic" gas grates. Opportunity is taken for an instructive display of the laboratory appliances manufactured by the firm.

Wilsons & Mathiesons, Ltd.—A popular Wilson "Sunbeam" gas fire is fitted in the hall of the exhibition.

A Radiation "Perfectea" boiler is also shown.

Throughout the period of the exhibition gas cookery demonstrations and lectures have been given, and cake baking competitions were arranged. In addition there were lectures, including one by Dr. H. Hartley, of Radiation Ltd., on "Heating and Ventilating by means of the Gas Fire."

PLANT EXTENSIONS AT CHESTERFIELD.

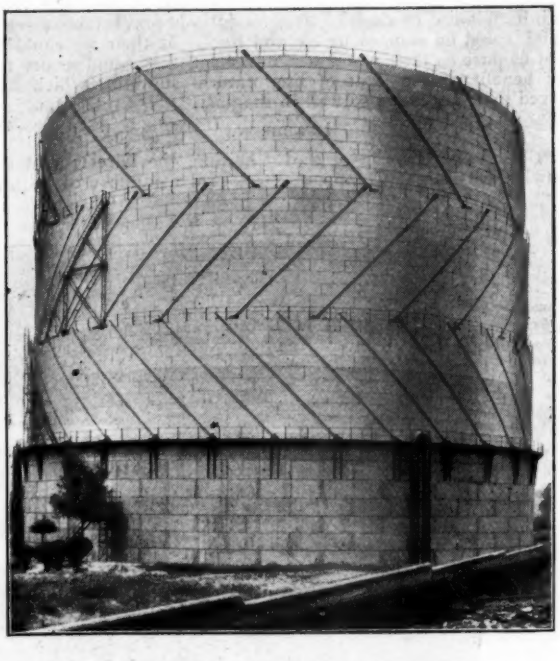
A Stage in the History of a Progressive Undertaking.

Since times now very far back in history, Chesterfield has possessed a landmark which no traveller passing by or through the town has missed—the twisted spire of its parish church. How this twist originally came about is a matter upon which divergence of opinion is met; but there the distorted spire is, towering above the surrounding buildings (the church standing upon a hill), and catching the eye of all who come within sight of it. Now, it is declared, as the result of an enterprise the successful completion of which was marked in festive manner on Wednesday of last week, July 4, Chesterfield has received another landmark—this time in the form not of a spire, but of a spiral holder. It is true that this holder—with the modesty generally attaching to gasholders—has not perched itself upon an eminence, but has, as it were, secluded itself in a lower part of the town. Nevertheless, the inhabitants profess to see in it great possibilities as a guide to those who may lose themselves on the countryside. All will admire it as an engineering structure, the gracefulness of the lines of which is emphasized by the delightful shade of grey selected for its colouring. We feel inclined on this occasion to echo the sentiment of her Worship the Mayor (Miss Councillor Violet Markham, C.H., J.P.), who said she was glad that Alderman George Clark, J.P. (who is the esteemed Chairman of the Gas Committee), "had not painted the town red."

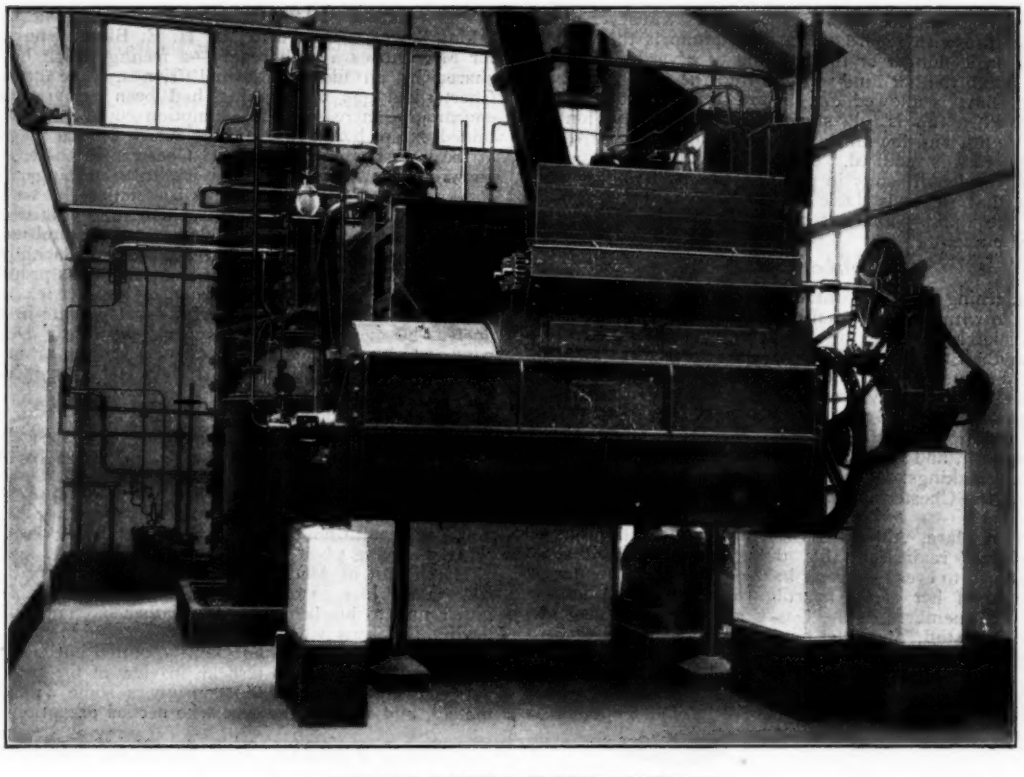
THE GAS UNDERTAKING.

This progressive gas undertaking possesses—as, of course, it necessarily must do—a progressive Engineer and Manager, in Mr. Harold Davies, with the result that visitors last Wednesday, when attending the inauguration of the new holder already referred to, sulphate of ammonia plant, workmen's messroom, &c., at the Central Gas-Works, West Bars, had placed in their hands copies of the "Gas Bulletin," issued by the "Chesterfield Corporation Gas Service." This is a little publication which has been prepared for the ratepayers of the Borough of Chesterfield; and its primary object is to set forth simply a few of the many uses to which gas can be applied, and to record the services offered. It is recognized that the gas consumers are really the shareholders of the undertaking, and as such are entitled to a dividend, which is offered to them in the form of full and efficient service. And here, perhaps, is found, in part at any rate, the reason for the progress of the undertaking: "Our object is to remedy promptly your complaints; and they will be appreciated just as are your compliments."

The Chesterfield Gas-Works commenced to supply gas in 1826; and from the first ledger of the Company it appears that the price per 1000 c.ft. then charged was 13s. 6d. The Company continued to supply gas until 1895, when the Chesterfield Gas and Water Board Act was passed; and the undertaking in



The New Two-Million Holder.



TWO-TON WILTON SULPHATE PLANT.

1896 came under the control of that body. In 1920, under the Chesterfield (Extension) Order of that year, the gas undertaking came under the full control of the Chesterfield Corporation. From this time, under progressive management, the undertaking has forged ahead; the annual consumption of gas having doubled, and the price being among the cheapest in the country. For the past eighteen months a maintenance system (free labour) has been in operation; and at present more than 2000 consumers are enjoying its benefits. Gas cookery demonstrations are held periodically in the Corporation's lecture hall; and there are in the town excellent and thoroughly up-to-date showrooms.

"CHESTERFIELD'S NEW LANDMARK."

This is how the spiral holder is referred to in a brochure (prepared for the inauguration), which states that in view of the rapid development of the borough and the out-districts, and the corresponding demands upon the resources of the department, the Gas Committee have been faced with an increasing responsibility in providing a cheap and efficient supply of gas for all purposes within the area of the undertaking's supply. February of 1925 witnessed the inauguration of new carbonizing plant, after which condensing, exhausting, washing, and scrubbing apparatus was installed.

The necessity for increased storage accommodation was realized when it was reflected that twenty-five years had elapsed since the last three-lift spiral holder of 574,000 c.ft. capacity was installed, and that the design in weight of this holder was unsuitable for modern conditions of gas distribution. The Council's approval for the borrowing of the money required for the building of a new holder and tank, with the requisite valves and connections, was given in July, 1926, and sanctioned by the Ministry of Health in the following month. Specifications and drawings for the work were prepared by Mr. Davies; and the construction of the holder and tank was entrusted to Messrs. Robert Dempster & Sons, Ltd., of Elland.

A reinforced concrete foundation was completed for the structure in December, 1926; but the labour troubles in the coal fields that year prevented steel being obtained with that promptitude which would have enabled the contractors to proceed rapidly with the construction and completion of the holder.

The tank is 162 ft. 6 in. in diameter and 36 ft. 4 in. deep, and holds approximately 4½ million gallons of water. The holder has three lifts and a capacity of 2 million c.ft. When fully inflated it stands 153 ft. above the level of the adjacent land. The following are the dimensions of the three lifts:

Inner lift	. .	154 ft.	diameter by 35 ft. 6 in. deep
Middle ,,	. .	157 ,,	,, ,, 35 ,, 6 ,, ,,
Outer ,,	. .	160 ,,	,, ,, 35 ,, 6 ,, ,,

The total weight of steel in the structure is about 1000 tons. The inlet and outlet pipes are 24 in. in diameter.

MODERN SULPHATE OF AMMONIA PLANT.

The installation of a modern sulphate of ammonia plant, with buildings, &c., was necessitated by the worn-out condition of the old plant, which was purchased and installed in 1911. Bearing in mind that the plant now superseded was not new when acquired, and that it was not intended to produce the class of salt which market conditions to-day principally demand, it may fairly be claimed that it gave very useful service.

As soon as a new plant was decided upon, tenders were invited for the erection of reinforced concrete buildings, settling tanks, &c., for use with the plant, and Messrs. Blythe & Son, of Mansfield, were entrusted with the work—the contract for the sulphate of ammonia plant being placed with the Chemical Engineering and Wilton's Patent Furnace Company, Ltd. The general specifications and plans for the whole of the work were prepared by Mr. Davies. The plant is built upon a raft of reinforced concrete, made impervious to acid by special asphalt coverings. It is capable in its present condition of producing 2 tons per day of neutral, dry salt in a fine crystalline state; and by slight additions to the still only, will produce 3 tons per day. The salt is ready for bagging and sale immediately upon production.

In the "JOURNAL" for June 27 last (pp. 1014-15) there was an article descriptive of the 12-ton per day plant erected at the Granton Gas-Works of the Edinburgh Corporation. Features of this plant are the absence of a centrifugal machine and the employment to the utmost extent of mechanical handling devices, so as to reduce labour costs as far as possible. The Edinburgh plant thus described by us a fortnight ago is economical for all sizes from 5 tons a day upwards; but the type of plant which is economical below that point—*i.e.*, from 1 to 4 tons a day—is that which has been erected at Chesterfield. This, again, does not employ any centrifugal machine. The drying machine is constructed to handle the salt direct from the draining table, containing anything from 10 to 15 p.ct. of moisture; and the arrangement of the plant is such that one man per shift can easily operate it.

Among the special devices in connection with the plant is the method of draining the salt by means of the draining boxes provided, whereby a fairly deep layer of salt is run into the boxes. Draining tiles are fitted beneath, providing automatic suction of the moisture, and reducing the moisture content in the salt to as low a point as possible. Neutralizing is accomplished here by an ammonia spray; but alternatively, of course, this can be done by some other solid neutralizing agent—such as carbonate or soda ash—at the entrance to the drying machine. The drying machine is fitted with an arrangement for feeding the neutralizing material into the machine automatically. From the point of view of the size of the crystals, the makers of the apparatus find that it is always best to work a sulphate of ammonia plant to near the full capacity for which it has been designed. Many other factors, of course, also enter into the production of large crystals, not the least being the selection of the acid and the strength of the bath in the saturator.

An important point about the liquor still in the plant under notice is that, by removing the small handhole doors on each section, the whole of the inside of the still can be cleaned; and

the hoods can be removed through these doors whenever necessary. A feature with regard to the lime pump is that it does not depend on a plunger or the drawing of a vacuum beneath a valve to pump the hot lime solution into the still. The boiling milk of lime is allowed to gravitate into the body of the pump; and when this is full, steam pressure is opened on the top of the liquor, and the milk of lime is bound to be driven to the place where it is required. Certain types of plunger pumps are inclined to give difficulty in pumping boiling liquids, owing to the fact that steam is liable to be drawn into the plunger instead of the liquid. That, of course, is entirely obviated by this type of pump.

THE INAUGURATION.

On the morning of July 4, there was a large assembly at the gas-works, to witness the formal inauguration of the new plant by Miss Violet Markham (the Mayor). Thereafter there was luncheon at the Station Hotel, at which those present included the Mayor and members of the Corporation, Alderman George Clark and Councillor A. W. Swale (respectively Chairman and Vice-Chairman of the Gas Committee), Mr. Harold Davies (Engineer and Manager of the works), Mr. H. E. Bloor, B.Sc., B.Eng., of York, and representatives of a number of surrounding gas undertakings. The speeches showed in what high esteem both the Chesterfield undertaking and those connected with it are held.

In the first place, Alderman Sir Ernest Shentall proposed "The Mayor;" remarking that the name of "Markham" was well known to every engineer in this country. The Mayor, in the course of her reply, heartily congratulated Alderman Clark and the members of the Gas Committee, and also Mr. Davies and his staff, upon the new works which it had been her duty and privilege to inaugurate that morning. The holder would be a visible symbol of that broad and progressive spirit which every one of them was proud to associate with the name of Chesterfield.

The toast of "The Chesterfield Corporation Gas Undertaking" was entrusted to Mr. H. E. Bloor, who said he had for Mr. Davies a high regard—a feeling which he knew was shared by all his professional friends. The growth of the Chesterfield gas undertaking had been remarkable; and so enormously increased a consumption could not have been attained except by an undertaking which offered the best service at the lowest practicable price. Chesterfield possessed excellent showrooms, which would do credit to a bigger place. No corporation official could do his best unless he was supported first by an understanding, sympathetic, and enthusiastic Chairman, and secondly by a whole-hearted Committee. All this Mr. Davies had in Chesterfield. In his acknowledgment, Alderman Clark declared that Chesterfield was proud of its gas undertaking; and they were proud of Mr. Davies and of what he had done. In connection with developments in the gas industry, he mentioned that his firm (the Bryan Donkin Company, Ltd.) were making for an undertaking three machines, each of which would pass 1 million c.ft. of gas per hour at 15 lbs. pressure.

The toast of "The Contractors" was proposed by Councillor Swale, and replied to by Mr. W. H. Handley (Messrs. Robert Dempster & Sons) and Mr. N. Wilton (Chemical Engineering and Wilton's Patent Furnace Company). It was pointed out that the present one was the third holder which Mr. Handley's firm had erected at Chesterfield; and also that the firm were now engaged in building a 3 million c.ft. waterless holder and a big purifying plant for Vancouver.

The health of Mr. Davies was afterwards cordially drunk. Alderman Clark extended a hearty welcome to Mr. Davies's father and to his brother. The father he congratulated upon having two sons who had reached such high positions in the gas industry. Mr. Harold Davies pointed out the necessity of first-rate service in Chesterfield, in view of the fact that out of between 18,000 and 19,000 consumers some 14,500 used slot meters, and so were the type who needed exceptional service.

BATLEY'S NEW GAS SHOWROOMS.

Inauguration Ceremony.

On Monday, June 25, new showrooms of the Batley Corporation Gas Department were officially opened; and the guests invited to take part in the proceedings were afterwards entertained at luncheon in the Town Hall by various gas appliance manufacturers.

The MAYOR (Councillor C. R. Spedding), before asking Councillor John Deasy, J.P. (Chairman of the Gas Committee), to perform the opening ceremony, congratulated the Committee and their Manager (Mr. R. H. Duxbury) on their enterprise in building the showroom.

Councillor DEASY, declaring the showrooms open, said he hoped the reward of enterprise would be a good sale of gas appliances and a consequent increase in gas consumption. The new building would, he trusted, benefit consumers.

Then Mr. ROSLING, a representative of Messrs. John Curtis & Sons, Ltd., of Leeds, the contractors for the window and showroom fittings, presented, on behalf of the contractors, a silver epergne, three silver vases, and two cut-glass candlesticks to Councillor Deasy.

The visitors were obviously delighted with the arrangement and appearance of the showroom. On the first floor is a demonstration room for cookery lectures, &c.

LUNCHEON SPEECHES.

At the subsequent luncheon, which was presided over by the MAYOR, the first toast following "The King" was that of the "Batley Gas Committee and Undertaking."

Mr. W. M. MASON, Manager of the British Commercial Gas Association, who submitted this toast, congratulated the people of Batley on the possession of a fine new showroom to illustrate the possibilities of gas in the solving of domestic and commercial problems. Some people, even gas committees and gas boards, thought that because gas had been serving the public for over a century, giving a wonderful service that never failed, it had seen its day, and that it was time to look for newer methods. It was, therefore, all the more pleasant to come to a place like Batley and find that under the able leadership of Councillor Deasy and the Gas Committee, who did not believe gas was a back number, there was being opened a splendid new showroom. Behind the public mind there was probably the idea that gas was old-fashioned; but sometimes things accrued in value the older they got. The public had a way of forgetting things. They forgot that gas was a service that never failed; that it helped working folk to have an easier and better time; and helped to solve the smoke problem. It was wise and necessary that the ratepayers should have an opportunity of seeing what could be done with modern gas under modern conditions to ensure comfort. He was interested in the recent observation of the Duke of York, when addressing the Sales Managers' Association in London, that "Advertising is the new form of education." This thought might well be written in gold on the top of Batley's showroom. Education which was of any use was not a matter of immediate returns. It was only by showing up-to-date goods and apparatus, and educating the public as to what gas could do and was doing, that they could be made to realize that here was a thing worth investing money in. As to the idea that gas was old-fashioned, he was reminded that in the Carlton Club, the last word in fashionable restaurants in London, all the food was cooked by gas, and that the reorganized kitchen at St. Thomas' Hospital was entirely equipped with gas. He believed the gas industry had entered a new era, just as in Batley they had started a new era in gas supply.

Councillor DEASY, in the course of his reply, said that Batley had a Gas Engineer and Manager of whom they were very proud—a man of ability, tact, and organizing capacity, well supported by a loyal staff.

Mr. S. C. WHITFIELD, in the absence of Mr. C. S. Shapley, of Leeds (the Senior Vice-President of The Institution of Gas Engineers), proposed "The Town and Trade of Batley;" this toast being responded to by the MAYOR.

Mr. E. H. HUDSON, Engineer and Manager of the Normanton Gas Company, and Mr. D. MCCALLUM GIBB, of the Parkinson Stove Company, replied to the toast of "The Visitors and Appliance Manufacturers;" and the final toast was that of "The Gas Engineer," to which Mr. DUXBURY briefly replied.

Tars for Road Purposes.—For a considerable time no British Standards for road tars have been in existence; those first issued in 1916 having been withdrawn when the Ministry of Transport published their Specifications, which were a revision of the original Road Board Specifications. Recently the Ministry of Transport brought to the notice of the Association the desirability of remedying this position and recognizing as British Standards the Specifications officially adopted by the Ministry, and with which all local authorities are familiar. The proposal was referred to the appropriate Technical Committee of the "B.E.S.A.," and Specification No. 76, Part 1-1928, for Tars (Nos. 1 and 2) for Road Purposes, is the outcome, and contains the Specifications Nos. 3(*a*) and 3(*b*) of the Roads Department of the Ministry of Transport issued as British Standards. Copies of the Specification may be obtained from the Publications Department of the British Engineering Standards Association, 28, Victoria Street, Westminster, S.W.1, price 2s. 2d. post free.

OIL FROM COAL.

Hydrogenation Problems at Birmingham University.

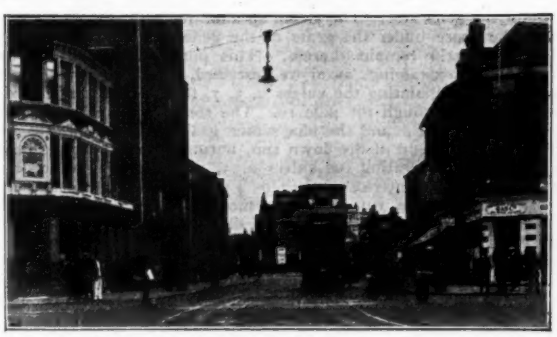
The report of the work of the Mining Research Laboratory of the Birmingham University during the past year has just been issued by the Executive Board, of which Prof. J. S. Haldane is Chairman.

Dealing with the hydrogenation of coal, the report states that a considerable number of coal samples from different seams and of different composition had been tested under, as far as practicable, the same conditions of temperature and pressure. These experiments had shown clearly that the yield of oil by hydrogenation under high pressure depends upon the composition of the coal. Investigation of the constituents of coal which undergo hydrogenation was being made in the case of several coals. The action of steam upon coal was also being investigated, as this would appear to have, in the case of some coals at any rate, an important influence on the oil yield. Little information was available regarding the behaviour of steam upon different coals at various temperatures.

It was evident from the erection of large plants in Germany for the hydrogenation of brown coal and bituminous coal, that the process was believed by some to have reached a practical stage. "We believe," adds the report, "that the knowledge now being accumulated as a result of our researches will be of considerable service in indicating the applicability or otherwise of the hydrogenation method to any one coal. A new high-pressure bomb has been made in the mechanical engineering department to our design, for the purpose of dealing with small quantities of material. By means of this it is hoped to obtain information more quickly than with the larger autoclave, and especially in the case of products or materials of which we can obtain only a small quantity in the laboratory."

SUSPENSION SYSTEM FOR STREET LAMPS.

The accompanying photograph is of a suspended gas lamp at Wandsworth. The span is very great, and the attachments



have been made to the wall of an hotel on one side of the street and to the Gas Company's showrooms on the other side. The effect at night is excellent; the 18-light Sugg "Rochester" lamp of 180,000 c.p. giving a beautifully even illumination over a large area. The system of suspension adopted is that of the London Electric Firm, Brighton Road, South Croydon.

The light is controlled by a distant controller, clock operated, and so turns on and off automatically at the desired times notwithstanding that there is but a single gas supply tube between the controller and the suspension gear. It should, of course, be emphasized that no flexible tube is used, and yet the lamp traverses to the side and lowers to the ground for cleaning, &c., by simple operation of a double-barrelled winch. The gas joint will withstand as much as five times the pressure of high-pressure gas. The equipment is being used in increasing numbers, and gives the greatest satisfaction.

"K" OILFEEDERS AND ECONOMIZERS.

An excellent seamless steel force-feed oilcan, known as the "K," is manufactured by Messrs. Joseph Kaye & Sons, Ltd., of Leeds. The body of the oilfeeder is solid drawn from one piece of sheet steel, and the handle, also of solid steel, is rivetted to the body. The joints are made by the serrated process—a method which gives a greater soldering surface and correspondingly increased strength. A holder is made for each size of feeder, which keeps the latter in an upright position.

"K" oil economizers constitute a highly satisfactory means of storing oil. No leakage can occur when filling smaller vessels; any overflow running back into the cabinet. When not in use, the lids close down, folding the delivery pipe; and all dust and foreign matter is excluded. The cabinets are strongly made in heavy gauge leaded iron, in sizes from 1 gallon to 100 gallons. Our illustration shows the square shape, but the circular container is available for those who prefer it.

Filling Etched Lines in Thermometers.—A method of colouring the lines and figures on etched-stem thermometers, developed by Messrs. Hannen & Bruce, of the United States Bureau of Standards, has been found to be much superior in durability to those now in use. A note in the "Journal of the Franklin Institute" states that it consists of a mixture of water glass and finely divided manganese dioxide, which is applied as a paste. A thermometer treated with this material retains the colour even when heated to 500° C., and can be used in hot oil, water, or steam without injuriously affecting the visibility of the lines. The ability of the material to resist attack by acids and alkalis has not been thoroughly tested; but the indications are that it is not entirely resistive to these. Pigments other than manganese dioxide may be used with the water glass to produce other colours. Application has been made for a patent, dedicated to the public, covering the material and its application.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Silica Retorts and Moisture Absorption.

SIR,—I have read with great interest and profit the paper by Mr. Stephen Hay before the Southern Association of Gas Engineers and Managers, together with the Appendix by Mr. A. Edwards.

With regard to the suggestion for the use of glue to stop the absorption of moisture from the jointing material by silica segments, it may interest you to know that as far back as 1917, in rebuilding vertical retorts with silica segmental blocks, I experienced considerable trouble in getting satisfactory vertical joints owing to the absorption of the water from the jointing material by the porous silica segments.

The trouble was intensified by the fact that I had cut out the use of all fire cements, and was employing as a jointing material a very finely ground silica of the same composition as the segments. The absorption trouble was entirely overcome by brushing the joint faces of the segments with a thin solution of common glue. This had the effect of sealing the pores of the material to a sufficient extent to enable the jointing material to be worked with ease, and so a satisfactory joint was the result.

When the settings were heated up, the glue gradually charred and eventually burnt out without any detrimental effect on the retort material. I may say that we were working at that time with combustion chamber temperatures ranging from 1350° to 1420° C.

FRANCIS W. J. BELTON, Engineer.

The Christchurch Gas, Coal, and Coke Company, Ltd.,
Christchurch, N.Z.,
May 30, 1928.

Field's Analysis, and Costs per 1000 C.Ft.

SIR,—Answering the invitation given in your leader of the 4th inst., I am greatly in favour of the figures "per 1000 c.ft." being retained, as these are still of much importance both for records and for comparative purposes, and are the better understood by the man in the street, as the declared value of the gas is not always readily obtainable by him.

HUBERT POOLEY,
Engineer and Manager.

City of Leicester Gas Department,
Millstone Lane,
Leicester,
July 6, 1928.

REGISTER OF PATENTS.

Manufacture of Producer Gas and Water Gas. No. 285,004.

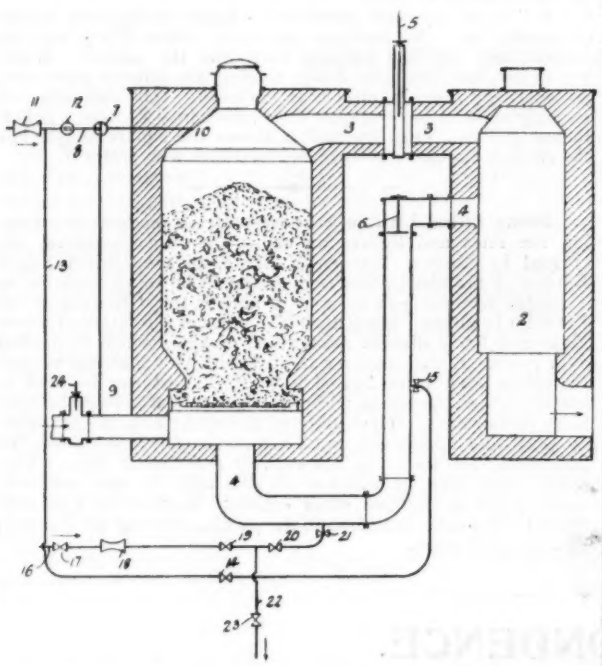
HUMPHREYS & GLASGOW, LTD., of Victoria Street, S.W. 1 (Assignees of SOCIETE DE CONSTRUCTION D'APPAREILS POUR GAZ A L'EAU ET GAZ INDUSTRIELS, of Paris).

No. 32,967; Dec. 6, 1927. Convention date, Feb. 8, 1927.

The continuous manufacture of water gas can be carried out by injecting steam and oxygen simultaneously into a generator in such proportions that the heat evolved by the exothermic reaction $2C + O_2 = 2CO$ compensates the absorption of heat by the endothermic reaction $C + H_2O = CO + H_2$. Under these conditions the actual manufacture of gas can be absolutely continuous, so that it is possible to dispense with the customary air-blasting periods, thereby avoiding the corresponding loss of fuel in the form of CO_2; and it is the object of the invention to increase the efficiency of this continuous process of working as well as to provide suitably modified apparatus for carrying out the process.

The invention therefore consists in a continuous process, of the type above defined, for the manufacture of producer gas and water gas in gas producers or generators of the industrial type, characterized by the fact that the fuel bed in the producer or generator is subjected to down-steaming as well as to up-steaming, in a manner known *per se;* the admission of oxygen simultaneously with the steam being effected either during the up run or during the down run, or during both. It is to be observed that the expression " continuous process " here connotes a gas making process which, even though it be subject to reversal of the direction in which the fuel bed is steamed, is never interrupted for blasting purposes. The process of the invention and the construction and arrangement of the apparatus employed are, say the patentees, such as to ensure perfect safety in the working of the controls.

The accompanying drawing shows diagrammatically a vertical section of a water gas generator and of a combustion chamber. In



Water Gas Plant Modified for Continuous Working on Steam and Oxygen.

modern apparatus, the valves 5 and 6 are interconnected, so that one is open when the other one is shut, and vice versa. The mechanism for operating these two valves also automatically controls a threeway cock 7, which is located in the steam piping 8 and permits steam to be injected into the generator either from the bottom thereof, through the pipe 9, or at the top thereof, through the pipe 10.

In order to carry out the continuous process according to the invention, a water gas plant of the usual type may be modified as follows:

1. In the steam piping, following the meter 11 and in front of the steam stop valve 12, is arranged a branch pipe 13 provided with a stop valve 14 and a regulating valve ·5. This pipe 13 opens either directly below the grate of the generator or preferably (as shown) into that part of the pipe 4 which connects the lower part of the generator to the reversing valve 6.

2. Oxygen is fed to the generator through a pipe 16, provided first with an expansion device 17, so that the oxygen may be admitted at a pressure approximating to that of the expanded steam. The oxygen then passes through a meter 18, through two stop valves 19 and 20, and finally through a regulating cock 21 before it enters the pipe 4. (The pipe 16 may, if desired, open directly beneath the grate of the generator; it may also be provided with an injecting device which ensures uniform mixture of the oxygen with the steam introduced into the generator.)

Between the cocks 19 and 20 is interposed an oxygen escape pipe 22 with a cock 23. This pipe is provided for the purpose of preventing any oxygen which may have leaked from the cock 19 from getting into the pipe 4 and thus creating risk of explosion when this pipe becomes filled with water gas at the moment of reversal. Furthermore, the arrangement in which the steam pipe 13 opens into the pipe 4 between the oxygen inlet to the generator and the reversing valve has the effect of preventing any leakage of oxygen through the valve 6, which might be dangerous by reason of the oxygen mixing in the chamber 2 with the manufactured water gas.

Water gas plant modified as above is adapted to be operated in accordance with one or other of the known gas making processes, according as it may or may not be deemed necessary (having regard to the nature of the fuel employed) to reverse the direction of the run.

It is to be assumed that the fuel has first been brought to the suitable temperature—for instance, by blasting with air admitted through a valve 24, or by blasting with oxygen.

In the first case—that is to say, when down-steaming is not required—the plant works with all the ordinary controls necessary for the manufacture of water gas closed (including the valve for exhausting the blast gases to atmosphere); and a simultaneous injection of steam and oxygen is effected by opening, by one control, the cocks 14, 19, 20, and closing the cock 23. (The proportion of the mixture is regulated by means of the regulating cocks 15 and 21, in accordance with the indications of the meters 11 and 18.)

In the second case, when down-steaming is necessary, the method of working will comprise two stages. In the first stage steam and oxygen in suitable proportions may be injected simultaneously at the bottom of the generator, an excess of oxygen being supplied so as to evolve more heat than is necessary for setting up the reaction which decomposes the steam. In the second stage, down-steaming may be effected simply by injecting steam at the upper part of the generator; the loss of heat during this period being compensated by the surplus heat evolved during the first stage, due to the excess of oxygen then employed. To set the plant for down-steaming, the valves 14, 19, and 20 are closed simultaneously and the valve 23 opened: then the steam inlet valve 12, which is usual in water gas plant, is opened, the cock 7 being suitably adjusted to direct steam only under the grate of the generator. The steam so admitted will in a few seconds purge the space under the grate of the generator of all the oxygen which may still remain therein. This purging step having been effected, down-steaming, as above described, may be put into operation by so manipulating the valves 6, 5, 7, that steam is admitted to the generator through the pipe 10. The steam will then pass down into the generator; and the blue water gas manufactured will issue at 4, 6. At the end of the down run, normal or up-run gas making is resumed by operating the valves 6, 5, 7, in the reverse order so as to purge all the interior of the pipe 4 of the water gas derived from the preceding down run. At this moment it is possible, without danger, to resume the injection of the oxygen and steam simultaneously.

In order to ensure absolute safety in the working of the apparatus, it is essential that the valves 19 and 20 shall not be capable of being opened when the gas valves 5 and 6 are in position for down-steaming. Interlocking mechanism is provided for this purpose.

It will be obvious that the above method of simultaneously injecting oxygen and steam beneath the grate remains the same in the case in which it is desirable to inject steam and oxygen into the upper part of the generator for down-run gas making. As in the former case, it is necessary to take the precaution of injecting the steam between the point of arrival of the oxygen at the upper part of the generator and the valve 5.

Purifiers.—No. 290,793.

WHESSOE FOUNDRY AND ENGINEERING COMPANY, LTD., of Darlington, and CHAMBERS, R. L., of Glasgow.

No. 8986; April 1, 1927.

One object of this invention is to make provision for raising a purifier cover and to provide supports for it to rest upon directly above the tank at a suitable height. The cover when thus raised forms a roofing over the vessel. Thus, with the invention it is essential that the cover be kept over the tank, and for working conditions that it be raised to an extent which previously had not been done and there to have supports upon which to rest. The invention also relates to constructional improvements, with a view to reducing capital cost and facilitating transport.

Pivoted or auxiliary supports are arranged to support the cover directly above the vessel at a suitable height. For raising the cover, lifting tackle is provided at two or more positions. For example, lifting devices of the davit type or of the runway type with hand-operated tackle may be used. With the former two davits may be provided located in opposing positions, and the tackle for each davit may extend from two positions on the cover. Thus, with two such tackles, attachment at four positions would be provided, and disposed so as normally to prevent the cover from tilting. Hand-operated tackle may be of the worm-gear pulley block type. For a battery of purifiers one set of davits may be provided for each purifier; or one set of davits may be used for the battery, the davits being removable to the positions required. With davits provided for each purifier one set of tackle only need be used, being removable as required. With the runway type, an overhead rail may be provided from which the tackles depend. For the cover when raised provision may be made

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7 Sectional Hotplate Bars of straight design that are really easy to wipe down.

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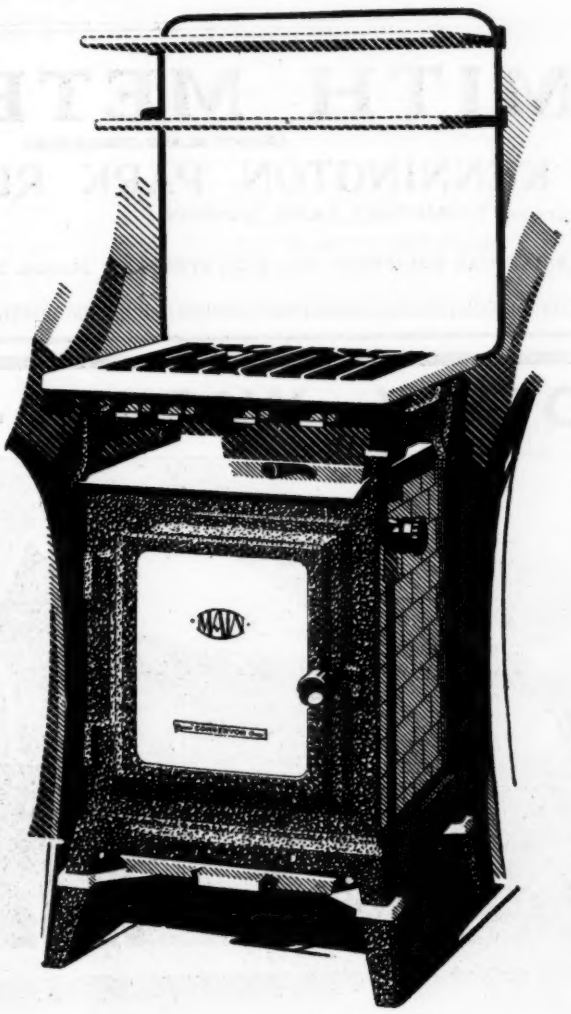
9 Accessibility to any part and facilities for quick dismantling and re-erecting.

10 Proved standardisation and interchangeability with even the earliest models of the present series.

11 Right- or left-hand gas rail connections and Hotplate Taps that do not interfere with the free movement of the grill pan.

12 Great variety of sizes, including Stand, Floor and Elevated types of Cookers with alternative range of Hotplates to each size.



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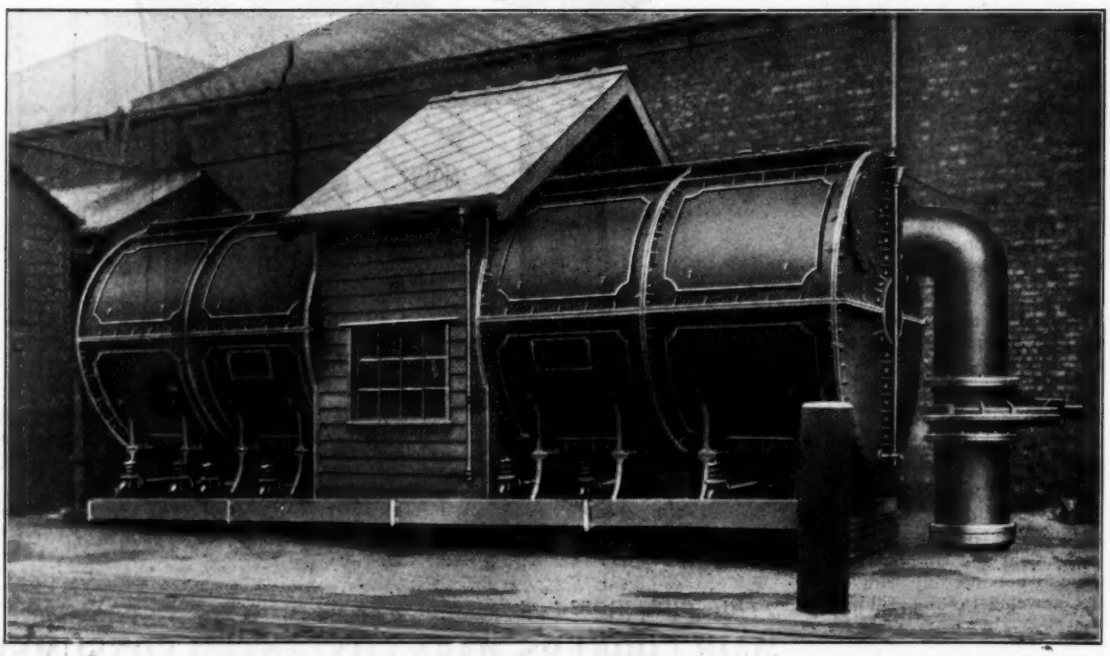
ROTARY - WASHER - SCRUBBERS



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for restraining it from tilting. For example, guys, struts, or the like may be provided.

As for the actual purifiers, according to this invention, they may be of circular tank formation, and the covers provided may be of domed form. The tank and cover may be of steel plate. One form of construction comprises the use of rafters on one face and purlins on the other. The rafters may be on the top and the purlins underneath or vice versa. The rafters, for example, may extend radially and the purlins concentrically.

These various points are shown in the drawings and are claimed separately.

Automatic Control Apparatus.—No. 291,223.

YATES, H. J., of Grosvenor Place, S.W. 1; HOWLETT & Co., LTD., of Birmingham; and DOLPHIN, J., of Hampton-in-Arden.

No. 13,903; May 24, 1927.

This invention relates to the thermostat, mainly in connection with a gas cooker. In such apparatus it is the usual practice to arrange the thermostat from side to side of the oven; and in order that the markings on the usual calibrated rotary head may easily be read, it is desirable that the face shall be arranged so as to face either towards the front of the oven or upwardly, the regulator valve and its spindle being at an angle to the thermostat. In one such arrangement the valve spindle was connected to the thermostat by a bell crank lever.

The primary object of the present invention is to provide apparatus of a generally improved form incorporating improved means for connecting the thermostat to the valve spindle; and the main feature which is described and illustrated is the provision of one or more pressure members disposed between the end of the valve spindle and thermostat, said pressure members being slidably mounted within a race or guide. The members themselves are in the form of balls or rollers.

Mouthpiece Doors.—No. 291,573.

NORRIS, W., of Burgess Hill.

No. 10,141; April 13, 1927.

This invention concerns the closing bar and hinge structures. It is usual to cast in one or two pieces. With constant use, considerable wear takes place at the hinge; and this allows the door to drop, thus causing trouble in closing because the bar may drop too low to be able to engage the catch.

The present invention provides the closing bar with a bolting face or prepared off-set extremity—for instance, "L" shaped, and the bolting face has guiding or interlocking provision for a combining hinge device made in two parts, which two parts also have interlocking means for combining with the bolting face of the closing bar. The simplest form of interlocking is groove and projection; and bolts or studs fix the two-part hinge elements to the bolting face of the closing bar following any adjustment or re-setting.

Dehydration and Naphthalene Removal.—No. 291 832.

COOPER, C., of Huddersfield.

No. 3913; Feb. 11, 1927.

The object of this invention is to provide an improved process of treating fuel gases, first to secure a reduction in their moisture content, and then to effect the removal of naphthalene. The invention is mainly concerned with the treatment of gases after they have been cooled and are in a condition in which they are customarily delivered to the mains; and it consists in subjecting the gases to treatment with hygroscopic bodies in order to effect at least a partial removal of water, and subsequently to treatment with oil in the liquid state, to secure the removal of naphthalene.

In cases where the invention is applied solely to facilitating the removal of naphthalene, the degree of dehydration of the gas may be relatively small—for example, sufficient merely to ensure that the gas passing to the naphthalene removal plant has a humidity of 80 p.ct. saturation. However, as the reduction in humidity to a greater extent can be almost, if not quite, as economically and readily effected, and as such reduction produces other advantages, the humidity is preferably reduced to a greater degree. Thus it may be conveniently reduced to a degree corresponding with 40 p.ct. saturation or even less—that is to say, to a degree adapted to prevent condensation of water in the distributing mains—prior to subjecting it to treatment for the removal of naphthalene.

The reduction in the moisture content may be effected with or without the aid of cooling; and where cooling is employed, the degree may be merely such as will secure the withdrawal of the heat set free in the operation of removing water from the gas. Where a reduction in the moisture content to a greater degree is desired, the gases may be subjected to further cooling or to the action of solid bodies, for example as described and claimed in specification No. 268,429. [See "JOURNAL," Vol. 178, p. 385.] Alternatively, or in addition, other treatment to secure an even greater reduction in the moisture content of the gas may be employed.

Where cooling is resorted to, or supplementary treatment with solid water-absorbing bodies is employed, such treatment may follow the treatment of the gas with oil to secure the removal of the naphthalene. In other words, the gas may be first subjected to the action of hygroscopic bodies in the liquid state without cooling or with a limited degree of cooling, then to a treatment to secure the removal of naphthalene, and subsequently to a further treatment to secure a further reduction in the moisture content of the gas. Preferably, where the removal of water from the gas is carried out in stages, the gas is first treated in accordance with the process claimed in the specification No. 248,841. [See "JOURNAL," Vol. 174, p. 164.]

A arrangement of apparatus for carrying the invention into effect is illustrated in the specification.

Low-Temperature Distillation.—No. 292,060.

NIELSEN, H., of Muswell Hill, and LAING, B., of Westminster.

No. 13,820; Dec. 4, 1926.

This invention relates to the distillation, with bye-product recovery, of carbonaceous materials, and to the gasification of the solid residues obtained by the distillation processes. It is claimed that coking coal is given the same degree of reactivity as a non-coking coal—that is to say, is made to retain its original cell structure—by being subjected to a preliminary heat treatment with gases containing sufficient oxidizing constituents to prevent agglomeration. The preliminary treatment may consist in drying or preheating coal in a dryer, rotary or otherwise. The coal is subjected to the action of a hot gas, such as combustion gases, containing a percentage of free oxygen of the order of from 2 to 8 p.ct., which will suffice to oxidize some of the coking constituents to the desired degree.

The material may then be subjected to a process of low-temperature distillation with bye-product recovery at temperatures not exceeding 600° C. The pieces of coal should not exceed 2 in. cube. The material so produced, state the patentees, is eminently suitable for water gas manufacture or for industrial purposes. The low-temperature coke may be subjected to a process of distillation at higher temperatures. The period of distillation is so controlled that at any stage a difference exceeding 120° to 150° C. is not allowed to exist between the temperatures prevailing at the centre and at the periphery of any particle.

When distilling materials containing a large percentage of oil, such as oil shales or torbanites, the volume of the distilling medium employed is preferably such that, after having effected distillation of the material, it may be cooled down to approximately 80° to 100° C. without causing the heaviest oil fraction to condense. It is essential, in order to obtain a freely burning coke, that the volatilizable oils should be withdrawn from the retort without excessive cracking; for if excessive cracking occurs, graphitic carbon is deposited on the coke and reduces its combustibility and reactivity.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Windermere Gas and Water Bill: Returned from the Commons, with amendments agreed to. Awaiting Royal Assent.

Hull Gas Order: Referred to Special Orders Committee.

HOUSE OF COMMONS.

Progress of Bills.

Tottenham and District Gas Bill: Referred to Unopposed Bills Committee. Reported, with amendments.

Bournemouth Gas and Water Bill: As amended, considered, to be read the third time.

Weald Electricity Supply Bill: Read a second time and committed.

Dover Gas Bill: Referred to Committee on Unopposed Bills.

RATING AND VALUATION (APPORTIONMENT) BILL.

Last Wednesday, in the House of Commons, Miss LAWRENCE moved an amendment to include premises used for trade purposes or commerce among the industrial hereditaments which will receive rating relief under the Rating and Valuation (Apportionment) Bill; but the amendment was rejected by 199 votes to 131.

Mr. J. BATEY (Labour, Spennymoor), who supported the amendment, asked whether it was the Government's purpose to assist the mining industry by de-rating not only the mines, but also other things, such as coke ovens, which had grown up around the collieries.

Under the scheme, observed Mr. BEN. RILEY (Labour, Dewsbury), whereas a private coke-producing firm would be entitled to 75 p.ct. reduction of its rates, the municipal gas undertaking, which, with regard to its coke, was in competition with the coke ovens, would obtain no relief at all. Was it fair that there should be this overloading of the municipal undertakings in their competition with private firms?

Mr. NEVILLE CHAMBERLAIN, Minister of Health, replying to the debate, said that either fresh taxation would have to be imposed in order to carry out the extension of relief suggested in the proposed amendment, or else the amount of relief must be diminished so that it might be spread over a wider area. The Government were of opinion that the available money would be best utilized if it were concentrated on productive, and not on distributive, industry. If assistance was given to productive industries, it followed that trades which depended on production would be benefited.

MISCELLANEOUS NEWS.

GLASGOW GAS DEPARTMENT'S PROFIT.

A surplus of £628,083, against the previous year's deficit of £946,336, is shown in the annual financial statement, issued on July 4, of the Glasgow Corporation Gas Committee for the year ended May 31. The accounts will be considered at a meeting of the Committee, when, it is understood, a proposal will be made that the present rates remain unchanged.

The gross revenue for the year is stated at £2,316,331, as against £2,289,738 in the preceding twelve months, while the gross expenditures were £1,289,757 and £2,753,818 respectively. To the expenditure side was added depreciation of capital amounting to £99,339, compared with last year's figure of £194,847, in addition to annuities of stock amounting to £17,370; interest on borrowed money, &c., £146,643; and sinking fund, £135,137.

About 598,000 tons of coal were carbonized during the year, which is a decrease of 63,695 tons. The quantity of gas made per ton of coal carbonized was 14,546 c.ft., which, with water gas, gave an average of 15,113 c.ft., as against 13,368 and 14,539 c.ft. respectively last year. The gas delivered amounted to 8870 million c.ft.—a decrease of 185 millions, or 2·04 p.ct., compared with last year's figure.

By the sale of coke, £160,532 was realized—a decrease of £172,034, representing a falling-off of 38,833 tons. It is pointed out that the average price obtained was 8s. per ton less.

The number of ordinary meters in use totalled 199,283 (an increase of 2811), while the 110,183 prepayment meters indicated an increase of 906. Gas cooking and heating apparatus numbered 331,418, as compared with 339,623 last year.

A RECORD YEAR AT BIRMINGHAM.

Gas Sales Increased by 243 Million C.Ft.

The Birmingham Gas Committee, in their annual report to the City Council, state that the authorized capital of the Department amounts to 4¼ millions, of which sum a quarter of a million has yet to be borrowed. During the year £286,338 was expended on various capital works. The gas sold and used on works was a record for the undertaking, the total sales being slightly in excess of 13,581 million c.ft. The previous record figure was for the year ended March, 1926, when the total sales amounted to approximately 13,390 millions. The price of gas was reduced by 4d. per 1000 c.ft. after the June quarter; the average net price realized during the year being 2s. 9·7d. per 1000 c.ft., as compared with 3s. 1·63d. in the previous year. The return from residual products showed a marked reduction, notwithstanding the increased quantities available for sale, both coke and ammoniacal liquor being very much reduced in value during the year. The credit balance on revenue account was £376,445.

Reference is made by the Gas Committee to the change-over to the therm method of charging as from the June reading of the meters; and they point out that it was hoped it might then have been possible to reduce the price of gas. This could not be done, however, owing to the unsatisfactory position of the residuals market.

The following are the year's statistics of the department:

—	*1927.*	1928.	Increase.	Dec.
Gas sold during the year (c.ft.)	*13,338,942,400*	13,581,191,000	242,948,600	..
New services laid during the year	*13,013*	11,940	..	1073
Cooking and heating stoves sold during the year	*6,210*	4,531	..	1679
Total number of cooking and heating stoves on hire at March 31	*113,288*	118,805	5,517	..
Total number of cookers supplied with prepayment meters at March 31	*119,123*	125,122	5,999	..
Total number of prepayment meters fixed or on consumers' premises at March 31	*124,775*	131,888	7,113	..
Total number of ordinary meters fixed or on consumers' premises at March 31	*105,818*	109,003	3,185	..

In presenting the report to the City Council, Alderman J. H. LLOYD, Chairman of the Birmingham Corporation Gas Committee, stated that satisfactory progress continued to be made in the installation of gas supplies to small house property. Particular attention had been given to the matter; and in order that the tenants of the houses in the poorer parts of the city might have the facilities afforded by gas supplies, every effort was made to induce the landlords or their agents to instal the necessary supply pipes in the property. Last year gas had been used more freely than it had ever been in the past. During the year sales of gas amounted to 13,581 million c.ft., which was a record in the history of the Department. Additional capital to the extent of £286,338 had been expended, principally in connection with the new vertical retort installation at the Saltley Works, and in purifying plant at Saltley and Windsor Street, in addition to what might be regarded as normal expenditure on new mains and new meters. The total expenditure on revenue account, which now included a full year's charges in connection with the superannuation scheme, amounted to £2,162,177. On the credit side of the account, sales of gas had produced £1,906,926—a figure which, of course, was very much below that of 1927, when prices had to be increased to meet the additional cost of imported coal. With the exception of tar, residual products had been very disappointing; both coke and ammoniacal liquor providing substantially less revenue. The Committee had hoped, he said, to recommend a reduction in the price of gas. The state of the residuals market, however, was such that they could not do that at the present time. It was expected that the revenue from residuals during the present year would fall to the extent of £111,000.

Mr. PARDOE seconded the resolution.

Mr. W. LEWIS moved an amendment asking that the Committee should consider and report on the possibility of a scheme whereby men in the Gas Department who were discharged owing to the introduction of new plant should receive some compensation.

Mr. W. H. MILNER seconded this; but, on a vote being taken, the amendment was lost.

The report was adopted.

YEAR'S WORKING AT BRADFORD.

Excellent Results.

In his report on the working of the Bradford Gas Department for the year ended March 31, Mr. Ernest J. Sutcliffe, the Engineer and Manager, states that in comparison with the figures for the preceding year, the gross income is decreased by £34,482, and the gross expenditure by £118,684, while the net revenue charges are less by £2466. The profit is £51,205, as against a deficit during the preceding year of £35,463. The net revenue appropriation account, which at the commencement of the year had a debit balance of £4433, now has a credit balance of £46,772. During the year £21,080 has been expended on new mains and services, and charged to capital account. The total expenditure on this account has been increased to £1,376,672; and of this amount £563,334 remains outstanding; £813,338 having been provided for redemption of loans. The total borrowing powers for the general purposes of the undertaking are £1,395,001; and there is now an unexpended balance of £18,329.

The amount received for gas was £396,652, or £24,909 more than the previous year. At the commencement of the year the price charged was on the basis of 4s. 7d. per 1000 c.ft., or 11d. per therm; but from the end of the June half-year the City Council approved the Committee's recommendation of an all-round reduction of 5d. per 1000 c.ft. (1d. per therm). The revenue per 1000 c.ft. sold over the whole year shows an increase from 3s. 8·639d. to 3s. 9·461d.

The total sales of gas for the year show an increase of 95,135,000 c.ft., or 4·75 p.ct.; the yearly total being 2,094,027,000 c.ft., compared with 1,998,892,000 c.ft. in 1927. The quantity sold is the highest recorded since 1914, and the percentage increase on the previous year the highest experienced since 1924. The demands for cooking, heating, and general domestic purposes have been further developed; and while the sales for industrial purposes compare favourably with recent years, a general improvement in the staple trade of the city is still delayed, with a consequent maintenance of adverse conditions. An analysis of the sales of coke shows that 13 p.ct. of the total was supplied for domestic purposes, 37 p.ct. to Corporation Departments, schools, churches, &c., and 50 p.ct. for industrial purposes.

The sales of appliances through the Darley Street showrooms continue to be satisfactory. The cost involved by the maintenance of the showrooms at their present standard, states Mr. Sutcliffe, is fully warranted by the advantages derived from them. On June 8, the Committee decided to reduce the price of gas from July 1 by 1d. per therm, or 5d. per 1000 c.ft.

GAS REGULATION ACT APPLICATIONS.

SECTION 1.

Salford Corporation.

The maximum price now authorized in respect of the supply of gas by the undertakers is 5s. per 1000 c.ft.; and the price which they have asked the Board of Trade to substitute for this price is 1s. 3d. per therm.

The undertakers have also proposed that during the period of five years from the date of the intended Order the minimum permissible pressure at which gas shall be supplied by the undertakers in the urban district of Irlam shall be such as in any main or in any pipe laid between the main and the meter having an internal diameter of 2 in. and upwards to balance a column of water 1½ in. in height, and that subject thereto the minimum permissible pressure at which gas shall be supplied by the undertakers throughout the area of supply shall be 2 in.

DECLARED CALORIFIC VALUE.

Solihull Gas Company (Shirley Area).—475 B.Th.U., in substitution for 500 B.Th.U. (Oct. 9.)

METROPOLITAN GAS COMPANIES' OFFICIAL TESTINGS.

The Gas Referee's Reports of the official testings for the past quarter give the following average calorific values for the gas supplied by the Metropolitan Companies named.

Commercial Gas Company.—505·3 B.Th.U. (declared calorific value, 500 B.Th.U.).

Gas Light and Coke Company.—503·5 B.Th.U. (declared calorific value, 500 B.Th.U.).

South Metropolitan Gas Company.—562·1 B.Th.U. (declared calorific value, 560 B.Th.U.).

South Suburban Gas Company.—502·3 B.Th.U. (declared calorific value, 500 B.Th.U.).

Tottenham District Light, Heat, and Power Company.—501·8 B.Th.U. (declared calorific value, 500 B.Th.U.).

Wandsworth, Wimbledon, and Epsom District Gas Company.—472·3 B.Th.U. (declared calorific value, 470 B.Th.U.).

SATISFACTORY PROGRESS AT LEICESTER.

In his report on the working of the Leicester gas undertaking for the twelve months ended March 31, Mr. Hubert Pooley, M.Inst.C.E., the Engineer and Manager, states that the price of gas was reduced after the Michaelmas readings of consumers' meters; the gross reduction meaning concessions in the aggregate amounting to £24,366 in the Christmas and Lady Day quarters. The reduction meant to the ordinary consumer something over 6d. per 1000 c.ft.

The technical results of the year's trading, he continues, were in many respects the most pleasing in the history of the undertaking. The quantity of gas made was 3002 million c.ft., being the largest amount ever made in twelve months; and the quantity of gas sent out was 3001 millions, being also a record. Additional consumers to the number of 2876 were connected to the mains, bringing the aggregate up to 74,734. Gas cookers increased to 66,647—the added business amounting to 2933 cookers in the year. The number of fires supplied by the Department in recent years increased to 17,490, in addition to which there are many thousands of privately owned gas fires. The outstanding debt in the works and plant is £968,438. and represents a sum of £5 11s. 1·5d. per ton of coal carbonized, or 6s. 7½d. per 1000 c.ft. of gas sold. Since the undertaking was purchased by the Council, the sum of £905,858 has been handed over in aid of rates. The ground lost through the dispute in the coal industry of 1926 has been recovered, and the position enables repayment to the reserve fund of the sum temporarily used to make good the loss sustained during that period.

STOKE-ON-TRENT GAS DOES WELL IN 1927-28.

Average Sale of Gas per Consumer Steadily Increasing.

The following extracts are from the annual report of Mr. A. Mackay, M.I.Mech.E., the Chief Engineer and General Manager of the City of Stoke-on-Trent Gas Department, for the year ended March 31 last:

Though faced with general depression in trade, it is gratifying to report increased business which far exceeds anything experienced since the year of federation (1911). The quantity of gas manufactured for the year was 1,598,577,000 c.ft., against 1,494,129,000 c.ft. the previous year, being an increase of 104,448,000 c.ft., or 6·99 p.ct. With the carbonizing plant now installed at the Etruria Works, it is possible to manufacture 8¼ million c.ft. of gas per day, of a calorific value of 470 B.Th.U. All the gas produced during the year to March 31 was manufactured on the old plant at Longton and Burslem and the horizontal retort system at Etruria. The results are most gratifying. The average sale of gas per consumer is increasing steadily every year.

The showrooms continue to be of very great service to consumers, not only from the point of view of being able to get up-to-date appliances, but also because they can receive advice on all the uses of gas, and, if necessary, assistance at their homes. There is a lady cooker demonstrator; and a system of anticipating complaints and a burner maintenance scheme are in operation. During the past few months a scheme has been inaugurated for letting on the hire-purchase system gas fires and boilers.

Centralization.

The most important feature of the whole year's work was the substantial completion of the centralization scheme. During that period the vertical retort installation, new purification plant, station meters, and the high-pressure main between Etruria and the Longport Works were proceeding; and with the exception of the high-pressure main to the Longport Works, the whole of this plant was ready for putting into operation at the end of the financial year. The satisfactory results in the manufacturing departments have reflected themselves in the financial position of the undertaking; the result of the year's working being a gross profit of £79,447, and a net profit of £15,126. Having regard to the industrial crisis which influenced last year's finances, when the price of gas was not increased, it is gratifying to note that there is an increased revenue of £2337; the total income being £314,252, as against £311,914. The income from the gas sold alone shows an increase of £12,376. The revenue from coke, however, has been reduced this year by £11,491. The undertaking's capital per million c.ft. of gas sold for the year ended March 31 only shows a slight increase as compared with the year of federation, at which time the Corporation was only in possession of the four works: Burslem, Fenton, Longton, and Stoke. Since that time the undertaking of the British Gas Light Company has been acquired, and the whole of the centralization scheme practically completed, which involved a total expenditure of over £600,000.

Price of Gas.

On this question, Mr. Mackay puts forward the following suggestions:

1. That the price of gas be reduced by 2d. per 1000 c.ft.
2. That a new scale of gas charges be introduced by which the more gas consumers use, the greater will be the advantage to themselves, irrespective of the purpose for which the gas is used:

	Per 1000 C.Ft. s.	d.	Per Therm. Pence.
Price of gas up to and including 20,000 c.ft. per quarter	3	3	8·297
From 20,000 to 100,000 c.ft. per quarter	3	0	7·659
From 100,000 to 500,000 c.ft. per quarter	2	9	7·021
From 500,000 to 1,000,000 c.ft. per quarter	2	6	6·38
Over 1,000,000 c.ft. per quarter	2	3	5·74

All less 3d. per 1000 c.ft. discount if accounts are paid within 28 days.

SOUTHPORT GAS DEPARTMENT.

The Southport Town Council, at their meeting on July 3, had before them the annual report of Mr. John Bond (Engineer and Manager) on the working of the gas undertaking for the year ended March 31. Mr. Bond says that during the year the gas consumed in the Southport area of supply amounted to 797 million c.ft.; 20·45 p.ct. of this being supplied through the prepayment meters. The average price received for all gas amounted to 9d. per therm, net, which is equivalent to 3s. 6½d. per 1000 c.ft. The net capital indebtedness at March 31 was £244,334. The gross profit of the estate for the year amounts to £55,433; and after paying interest and sinking fund charges of £26,925, and liquidating last year's deficit of £12,178, there remains a net profit of £16,329. This will be dealt with as follows: £7000 to be used to reduce the capital expenditure of the gas estate; £7500 to be the first contribution towards a working capital fund; £1829 to be carried forward to next year's account.

Since the opening of the new showroom (which took place on Jan. 26, 1926), to March 31 last, orders have been taken equivalent in value to £34,157.

Of the total (884,015,000 c.ft.) gas made, 735,447,000 c.ft. was coal gas and 148,568,000 c.ft. carburetted water gas. The manufacture of gas cost 2s. 5·20d. per 1000 c.ft. sold, compared with 3s. 6·79d. the previous year. Distribution costs rose from 4·24d. per 1000 c.ft. to 5·23d., and management and general expenses showed a slight increase—4·96d., compared with 4·65d.

BURNLEY GAS SUPPLY.

Mr. J. Herbert Clegg, the Burnley Corporation Gas Engineer, in his report on the working of the Gas Department for the year ended March 31 last, states that the financial result of the year's working is a gross profit of £55,193, and a net profit of £25,428 after the payment of capital charges. The price of gas during the year to ordinary consumers in the borough was 9d. per therm until Dec. 25, when the price was decreased to 8d. per therm for one quarter, and from March 25 to 7½d., with scale reductions to domestic consumers to 5½d. per therm. From Sept. 25, 1927, the Committee reduced the charges for the price of gas without the borough to the same basis as charges applicable within the borough. Power and industrial charges were decreased from March 25 to 5½d., with scale reductions to 4d. per therm. All these prices are subject to 5 p.ct. discount. The gas sent out, 960 million c.ft. showed a decrease of 5·62 p.ct. on the previous year, when there was an increase of 11·98 p.ct.

The sale of appliances, states Mr. Clegg, has been astonishing considering the enormous increase in output during the year of the coal dispute. During that period a large number of appliances were purchased by consumers who had no alternative means of heating or cooking; and this might have resulted in the number of returns diminishing considerably the net business for the year. Instead of that, the sales show an appreciable increase over the year 1925-26 in cookers, boilers, and grillers; and the number of fires and radiators shows little decrease. As the Parker Lane Works still require to be run during the winter, and the cost of gas produced at that works amounts at least to 6½d. per 1000 c.ft. more than the cost at Oswald Street, it is desirable to close down at Parker Lane and remove the gas-making operations to the new site, or alternatively purchase a supply of coke oven gas, if this can be done at a price which will show some saving over the cost of gas manufactured at Oswald Street, in order to compensate for the disadvantages and risks attendant on the purchase of crude gas in bulk.

Good Working at Walsall.—The annual report of the Gas Department of the Walsall Town Council states that the total receipts for the sale of gas for the past year amounted to £135,747, compared with £126,539 in the year 1926-27. The other items in the accounts yielded closer comparison; among them being: Gas fittings, rental of stoves, &c., £7938, as against £8176; and residual products £35,977, compared with £47,644. On the expenditure side, there was a big drop in the cost of coal; £50,426 being spent under this heading in 1927-28, as compared with £84,809 in 1926-27. Including £7163 for management, the total working expenses were £133,689, against £179,472 in the previous year. The net profit from the undertaking was £14,219, compared with a loss of £28,590 in 1926-27.

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

The market is dull and lifeless, and there is a general shortage of prompt business for coal of any kind or class. The Northumberland steam coalowners have had a meeting to discuss the question of any alteration in the price agreement; but the conclusion seems to have been that the shortage of trade is too fundamental to be helped to any material extent by reasonable price reductions. This is the general opinion, and the Durham collieries also are facing idle time rather than reduce quotations. Naturally, with current trading in such a poor state, there is no disposition on the part of buyers to contract ahead at present prices.

Quotations remain as before. Northumberland steams ask the agreed minimum prices of 13s. 6d. for best screened downwards. Wear Special gas makes are 15s. 6d. f.o.b., best qualities 14s. 9d. to 15s., and seconds 13s. 3d. to 13s. 6d. Unscreened coking and second bunkers are 13s. 3d. to 13s. 6d., best unscreened steams asking 14s. 3d. Gas coke for shipment is 19s. 9d. to 20s. f.o.b. for prompt, and up to 21s. for forward delivery.

YORKSHIRE AND LANCASHIRE.

Gas coals are being inquired for in respect of forward delivery, and recent quotations show slight advances over last year's figures. It is anticipated that this section of the trade will show an improvement in the returns to the coalowners.

The industrial outlook does not seem to improve, especially among the "key" trades. Washed fuels, which appeared likely to improve in value some weeks ago, have not maintained the higher prices, although the smaller grades, including slacks, have appreciated, especially for coking purposes.

The export section reports progress, the subsidy under the Five Counties Scheme helping in this direction.

During the past week the markets for domestic fuel have been somewhat on the low side, and all descriptions have been put into stock.

The following are the Humber bunker and export prices, f.o.b., usual shipping ports:

South Yorkshire—Hards, Association, bunkers 17s. 3d. to 17s. 6d. export 14s. 3d. to 14s. 6d.; screened gas coal, export 14s. to 15s. 6d.; washed trebles, 15s. to 15s. 6d.; washed doubles, 14s. 3d. to 14s. 6d.; washed singles, 13s. 6d. to 14s.; washed smalls, bunkers 12s. 3d. to 12s. 6d., export 10s. to 10s. 3d.; rough slack, bunkers 11s. 6d. to 11s. 9d.; smithy peas, export 16s. 6d. to 18s. 6d.

West Yorkshire—Hartleys (f.o.b Goole), export 13s. 9d. to 14s.; screened gas coal, 14s.; washed trebles, 14s. 9d. to 15s. 3d.; washed doubles, 13s. 6d. to 13s. 9d.; washed singles, 13s. 6d. to 13s. 9d.; washed smalls, 10s.; unwashed trebles, 14s.; unwashed doubles, 11s. to 11s. 3d.; rough slack, 8s. 9d. to 9s. 3d.; coking smalls, 7s. 9d. to 8s. 9d.

Derbyshire and Nottinghamshire—Top hard, bunkers 16s. 6d. to 17s. 6d., export 14s. 3d. to 15s. 6d.; cobbles, 14s. to 15s.; washed trebles, 14s. 6d. to 15s.; washed doubles, 14s.; washed singles, 13s. 6d.; washed smalls, bunkers 12s. 3d. to 12s. 6d., export 10s.; unwashed doubles, export 11s. to 12s.; rough slack, bunkers 11s. 6d. to 11s. 9d., export 9s. to 9s. 6d.

Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, bunkers 15s. to 16s., export 12s. to 13s. 3d.; gas coke, export 21s. to 23s.; furnace coke 18s. 6d. to 19s. 6d.; washed steam bunkers, 15s. 9d. to 16s. 3d., all per ton.

MIDLANDS.

Notwithstanding the drastic restriction of output, the market is still over supplied in all the main branches. Prices are accordingly weak. In the coking districts, the reduced production of slack has involved some local rearrangements. Coking plants have in certain instances ceased to operate. This has caused some apprehension among blast-furnacemen and other coke users. It is said that increased tension is becoming apparent.

The fact that there is still plenty of blast-furnace coke available at 12s. to 13s., according to quality, shows, however, that no serious stringency has developed yet. A blast-furnace which is to be restarted in Lincolnshire will offset the one extinguished at Kettering. Demand for foundry and forge pig iron keeps so persistently below supply, however, that there seems no satisfactory alternative to further curtailment of output.

Public utility undertakings, manufacturers, and other consumers are able to get all the slack they want; prices ruling at 6s. to 7s., and rather more for specially good grades. Market conditions are not very free, however. There are no spot lots on offer. D.S. nuts have been done in exceptional instances at rather less than 8s., as previously reported; but that is about the ruling price. Spot lots are not numerous.

The July quota for pits in the Five Counties Scheme has been fixed at 60 p.ct. of standard, the same as in June.

New Works of Messrs. T. S. Hall.

After more than half-a-century's expansion, the sheet metal and constructional engineering business of T. S. Hall has recently been moved to an extensive new works with a ground floor space of 16,000 sq. ft. The new address is Southville Works, Southville, Bristol. Though the business has not yet completely settled in the new quarters, the firm's work is being carried on apace, and the scene of the main shop is a busy one. T. S. Hall's chief activities are for gas companies, gas stove manufacturers, builders' merchants, and the milling trade, but they can deal with most requirements in sheet-metal work, particularly of the light and medium types.

SENSIBLE HEAT DISTILLATION, LTD.

Annual General Meeting.

The Annual General Meeting of this Company was held at St. Ermin's Hotel on June 25, under the chairmanship of Mr. Frank Middleton.

The Chairman, in the course of a long speech, mentioned that the primary assets of the Company consisted of certain inventions and processes in respect of which they held practically world-wide patent rights. Already they had entered into agreements for the right of user of certain of their patents in Great Britain and Australia, in consideration of which they had received £225,000—£50,000 in cash and £175,000 in fully paid ordinary shares. Having explained how this had been dealt with, Mr. Middleton observed that the authorized share capital of the Company had been increased from £70,000 to £100,000. They had important agreements in negotiation with various foreign countries, two of which it was anticipated would be completed at an early date. Whereas the Company was originally formed to develop the "L & N" process for the distillation of carbonaceous materials, they were now in possession of patent rights and processes which went far outside the original scope of their contemplated activities, and which might prove of great potential value.

Col. J. T. C. Moore-Brabazon, M.C., M.P., Chairman of "L & N" Coal Distillation, Ltd., seconded the adoption of the report. He remarked that the Barnsley plant had been working satisfactorily, carbonizing all grades of coal, for a year. A full-scale commercial unit had been erected at the New Lount Colliery, Leicester, and had been started up.

[Since the meeting, announcement has been made of the fact that General Georges Patart—who expresses the opinion that the "L & N" processes are the best he knows for the separation by distillation of the primary constituents of bituminous coal, lignite, and shale, and that these processes offer a most interesting development in France—will collaborate with the French company which Sensible Heat Distillation, Ltd., are about to form.]

TRADE NOTES.

"Newbridge" Gas Controllers for Mirfield.

The Horstmann Gear Company, Ltd., of Newbridge Works, Bath, have received instructions from the Mirfield Gas Company to supply between 500 and 600 "Newbridge", clockwork gas controllers, comprising their well-known Type 3A/UNI for use in ordinary square lanterns, and Type 15/3A for suspension lamps.

The Pitman "Constant Speed" Deflector.

We are informed that Mr. Percy Pitman, of 25, Victoria Street, S.W. 1, has recently supplied his patent governors and water turbines to the South Metropolitan Gas Company and to the Bambridge Gas and Electricity Company. The new application of water turbines and governors to drive elevators, conveyors, &c., for coal, coke, and ashes is most interesting.

Perfecta Meters, Ltd.

The workmen and staff of Perfecta Meters, Ltd., held their annual outing on Saturday, June 30. They went by motor coach to Hastings, and then to the Black Horse Hotel, Battle, where they had dinner. Afterwards a cricket match was played on the beautiful ground of the Crowhurst Park Cricket Club; the works team playing the staff. The former won the match by eight runs, and thereby gained a handsome cup. Altogether it was a most successful function, and was thoroughly enjoyed by all who took part in it.

Semet-Solvay C.W.G. Plant.

The progressive steps which have brought the carburetted water gas process into competition with coal gas as a source of economical large volume supply are described in detail in a new bulletin just published by the Semet-Solvay Engineering Corporation, of New York. The bulletin, No. 43 of the Company's series, entitled "Carburetted Water Gas," begins with a record of improvements made in the water gas process since 1921, when the back run was introduced. The list includes the making of back-run gas, adoption of soft coal as generator fuel, elimination of hot valves, automatic fueling, continuous clinkering, utilizing of surplus heats to make process steam, absorption within the plant of effluent and drip, and the method of enriching back-run gas to increase volume and reduce its specific gravity. The chapter on low gravity back-run water gas presents to the gas industry a complete story of this newest development. It describes the manner in which the back run is employed to increase the volume of low gravity hydrogen gas in the finished product. In view of the attention that is being paid to the problem of mixing gases, the production of low gravity carburetted water gas becomes important and timely. Another operating refinement of importance is presented in the chapter on absorption of effluent and drip oil within the water gas plant. The bulletin describes how stream pollution can be avoided and economy increased by using waste liquors in making back-run gas. The bulletin also tells how the safety factor has been increased on the modern water gas machine. The description of the Steere 3-way back-run valve includes the arrangement whereby air is prevented from passing into the relief holder during the blast. A new control apparatus on the charging machine, to prevent leakage while fueling, is another contribution to safety presented; and there are illustrations of water gas plants and a drawing showing in detail the design of the Steere water gas machine. A copy of the bulletin will be sent on request to the Semet-Solvay Engineering Corporation, 40, Rector Street, New York.

The Carnforth Gas Company, Ltd., have reduced the price of gas by 6d. per 1000 c.ft., as from the meter readings at the end of June.

Reduction in Price at Ossett.—The Ossett Corporation have approved a reduction in the price of gas, from the June meter readings, by 6d. per 1000 c.ft., bringing the charge down to 4s. per 1000 c.ft.

Pittenweem to have Cheaper Gas.—The price of gas at Pittenweem has been reduced, by 5d. per 1000 c.ft., to 5s. 10d. At the annual meeting of the Company, a dividend of 5 p.ct., free of income-tax, was declared.

Lower Charges at Preston.—The Preston Gas Company have given notice that, after the reading of meters for the current quarter, gas will be reduced by 1d. per therm, representing a decrease of 4⅓d. per 1000 c.ft.

Cheaper Gas at Middlesbrough.—The Middlesbrough Town Council have decided to reduce the price of gas, by 2d. per 1000 c.ft., to 2s. 10d., *less* 10d. discount—*i.e.*, 2s. per 1000 c.ft., or 4½d. per therm. This is an exceedingly low price.

Rugby Gas Company.—The tenders for the £17,750 5½ p.ct. perpetual debenture stock which Messrs. A. & W. Richards offered on behalf of the Directors of this Company were opened on July 5. The issue was considerably over-subscribed at prices ranging from £104 per £100 down to the minimum of par.

London Coalite was registered as a public company on July 2, with a nominal capital of £100,000 in 1s. shares, to acquire any interests in inventions relating to the carbonization of coal, and to carry on the business of manufacturing and analytical chemists, &c. Registered office, 3-4, Clements Inn, Strand, W.C. 2.

Prices at Dewsbury.—The Dewsbury Town Council have confirmed the reduction of gas prices by 3d. per 1000 c.ft., to date from the meter readings for the September half-year. The new prices will be 3s. 11d. (4s. 5d. prepayment meters) within the borough, and 4s. 2d. (4s. 8d. prepayment) per 1000 c.ft. for outer areas.

"West's Gas."—The June issue of "West's Gas," the official organ of West's Social Society, is a "Gala Number." The cover, which is in colours, is most attractive, and the letterpress is exceedingly well illustrated. The Editor, Mr. N. Lazenby, is to be congratulated on a particularly bright and effective number.

Buxton Gas Undertaking.—The financial statement of the Buxton gas undertaking for the year ended March 31 shows a net surplus of £5450. The Gas Committee have decided that £3950 be transferred to the reserve and renewals fund, and that the balance of £1000 be carried forward and transferred to the relief of the rates in 1928-29.

New Directors of Radiation Ltd.—Sir David Brooks, Birmingham (Solicitor), Mr. C. Herbert Smith, Birmingham (late President of the Birmingham and District Society of Chartered Accountants), and Sir Gilbert Vyle, Birmingham (late President of the Association of British Chambers of Commerce), have been elected Directors of Radiation Ltd.

Falk, Stadelmann, & Co., Ltd.—The Warehouse and Head Office Staff of Messrs. Falk, Stadelmann, & Co., Ltd., enjoyed an outing on Saturday, June 30, at Margate. The party, numbering just over 400, left Holborn Viaduct by special train, and lunch was served at Dreamland Park. The lunch was presided over by the Chairman of the Company, Mr. Max Falk. The outing was in every way a great success.

Profits at Nuneaton.—The accounts of the Nuneaton Gas Company for the past year, presented at the annual meeting on July 6, showed that the net profit was £6209. The sum of £10,876 was brought forward; and after providing for fixed charges, the amount available was £14,695. A dividend of 7 p.ct. was recommended on the original capital, and of 4 p.ct. on the new capital stock, leaving a balance of £12,488 to be carried forward.

New Capital for Parkinson and W. & B. Cowan, Ltd.—This Company are offering to shareholders 50,000 of the unissued 7 p.ct. cumulative preference shares of £1 each at 20s. 6d. per share, and 100,000 ordinary shares of £1 each at 24s. per share. Subscribers for preference shares will be entitled to subscribe for two ordinary shares for every preference share allotted, but no application for ordinary shares alone will be considered. Additional working capital is required to expand the business.

Bradford Gas Charges.—The Bradford Corporation have confirmed a reduction in charges for gas by 1d. per therm from the meter readings for the June 30 half-year. The new prices are: Within the city, ordinary purposes, 9d. per therm; industrial purposes, 7⅜d. per therm. Outside the city, ordinary purposes, 10⅜d and 11d.; industrial, 9d.—all subject to a discount of from 5 p.ct. to 12 p.ct., according to the amount of gas consumed. Prepayment meter supplies, 1⅜d. per therm above ordinary prices.

Gas Profits at Abertillery.—The Abertillery Urban District Council Gas Department reports a gross profit of £4728 for the year ended March 31 last. After deducting repayment of loan charges, &c., there is a net profit available of £1310. The total quantity of gas made was 84,829,000 c.ft.—an increase of 3·5 p.ct. over the previous year. Notwithstanding keen electrical competition, the undertaking continues to make good progress, and the Manager (Mr. I. G. Jenkins) was complimented by the Gas Committee on the excellent results of the year's trading.

Chesterfield Gas Prices.—The Chesterfield Gas Committee have decided to charge the following prices for gas supplied within the borough: For the first 10 therms consumed per quarter, 10d. per therm; for the next 40 therms, 8d. per therm; for the next 50 therms, 7d. per therm; for the next 100 therms, 6d. per therm. An additional 1d. per therm will be charged where the fittings are owned by the Corporation; for supplies outside the borough, 1d. per therm will be added. Consumers with a consumption exceeding 200 therms per quarter will be subject to a special agreement.

Cheaper Hamilton Gas.—The Hamilton Town Council have decided to reduce the price of gas by 5d. per 1000 c.ft. This reduction brings the price down to 2s. 6d.—equal to that obtaining before the general strike.

Improvements at Matlock Bath.—The Matlock Urban Council have expressed their satisfaction and appreciation of the improvements effected at the Matlock Bath Gas-Works by the Manager (Mr. Maskrey). The accounts show that the gross profit for the year ended March 31 was £1271; and after paying principal and interest on loans, there was a net profit of £35. The balance standing to the credit of the net revenue account was £2271, against £2277 brought forward. The price of gas had been reduced 6d. per 1000 c.ft. during the year; and considering that the revenue account had been charged a considerable sum for gasholder repairs, the result of the year's working was satisfactory.

Industrial Charges Reduced at Bolton.—The Bolton Gas Committee have decided upon substantial reductions in the charges to industrial consumers. A new classification fixes lower rates to large consumers. An example of the effect of the new scales is that an industrial consumer taking 50,000 to 100,000 c.ft. per quarter for lighting and a similar amount for other purposes will get the whole of his gas for 2s. 6d. per 1000 c.ft., instead of 3s. 3d. per 1000 c.ft. on the old scale. There is no change in the ordinary domestic rates. The new industrial scale starts with consumers of under 1000 c.ft. 4s., 1000 c.ft. to 5000 c.ft. 3s. 6d., and 5000 to 15,000 c.ft. 3s. 2d., graded down to 2s. 2d. per 1000 c.ft. for consumers of a million c.ft. and over per quarter.

Cheaper Edinburgh Gas.—On the recommendation of Mr. H. H. Gracie, the Gas Committee of the Edinburgh Town Council have decided that the price of gas to ordinary consumers be reduced by 2d. per 1000 c.ft., making the charge now 3s. per 1000 c.ft. The reduction will take place as from the last reading of the meters, which began at the end of April. Prepayment consumers will have a reduction of 2½d. The last reduction in the price of gas in Edinburgh took place three months ago, and the present is the ninth reduction since 1921, when the price was 5s. 8d. per 1000 c.ft. The new charge is only 4d. above the lowest rate ever attained prior to the war. It was stated at the Committee meeting that an important factor in bringing about the reduction was the greatly increased output per ton of coal since the new retorts had been installed.

Recognition of Long Service at Birmingham.—At a meeting of the Birmingham Gas Committee, the Lord Mayor (Alderman A. H. James) made presentations of illuminated addresses to twelve old employees of the Department. Their total service was over 450 years. One of the recipients, Thomas Smith, of the Nechells Works, who has completed 47 years' service, recollects working alongside Mr. Will Thorne, M.P., in the retort house. Another recipient, Edward Scull, nearly 70, ran in the mile flat race at the recent annual sports. The other recipients of addresses expressing appreciation of the Committee were: Thomas Haynes (40 years' service), Edgar Moore (34 years), William Mason (40 years), Thomas Latham (37 years), Charles Bailey (37 years), David Harrold (46 years), W. H. Garfield (over 30 years), W. H. Cunningham (39 years), B. Waithman (35 years), and J. W. Cox (37 years).

Condition of Gasholders at Birkenhead.—At a meeting of the Birkenhead Town Council on June 4, Mr. Sidney Woodward, Chairman of the Gas Committee, announced that Mr. W. Newbigging, Consultant Engineer of the Manchester Corporation gas undertaking, had been retained to report upon the condition of the gasholders. He (Mr. Woodward) did not want to create a scare, but it was necessary that the gasholders should be overhauled in view of the calamities which had occurred in various parts of the world. One holder, erected in 1884 and reconstructed in 1894, showed a tendency to tilt during a gale, and they had lost over a million c.ft. of gas. The loss was not important, but there was a danger through the escaping gas. Mr. Woodward protested against the Finance Committee appropriating the product of a ¼d. rate from the undertaking towards rate relief. Last year the undertaking made a profit of £31,540 after liquidating a debt carried forward from the previous year of £31,421, leaving a net surplus of £119. Yet they were supposed to contribute £1765 from profits they had not made.

At a municipal jubilee parade held recently at Accrington, there were several tableaux. The Accrington and District Gas Board was represented by decorated motors.

William Robinson, of 139, Lower Spring Road, Longton, was at the Longton Police Court bound over for twelve months and ordered to pay 24s. to cover the damage for stealing 4s. in coppers from a prepayment gas meter belonging to the Stoke-on-Trent Corporation.

The weekly address to the members of the Stoke-on-Trent Rotary Club was given last week by the City Gas Engineer (Mr. A. Mackay), who outlined the history of the gas undertaking in the Potteries from the first introduction of gas for lighting and power to the present huge centralization scheme.

The Portsmouth Gas Company's works at Hilsea were visited by a party of about 200 ratepayers, representative of the Kingston, Buckland, Fratton, and St. Mary's Wards Ratepayers' Association, and their Copnor and Portsea branches, on July 4. The visitors were received by Mr. T. Carmichael, the Engineer and Manager, and under the direction of the staff made an interesting tour of the works. They were entertained at tea in the mess-room, through the generosity of the Directors of the Company; and speeches of appreciation and thanks followed, acknowledgment being duly made by Mr. Carmichael.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *July* 9.

There is nothing fresh to report in the London tar products. The volume of business passing is small. Values generally are unchanged, and are as follows:

Pitch, 65s. per ton.
Creosote, 7¾d. to 8d. per gallon.
Pure benzole, about 1s. 8d. per gallon.
Pure toluole, 2s. 1d. to 2s. 2d. per gallon.
Solvent naphtha, 95/160, 1s. 6d. to 1s. 7d. per gallon.
Pyridine, about 5s. to 5s. 3d. per gallon.

Tar Products in the Provinces.

July 9.

The average prices of gas-works products during the week were: Gas-works tar, 40s. 6d. to 45s. 6d. Pitch—East Coast, 57s. 6d. to 60s. f.o.b. West Coast—Manchester, 51s. 6d. to 52s. 6d.; Liverpool, 54s. to 55s.; Clyde, 52s. 6d. to 55s. Toluole, naked, North, 1s. 5d. to 1s. 6d. nominal. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 1½d. to 1s. 2d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid, 6½d. to 6¾d.; salty, 6d. to 6¼d.; Scotland, 6d. to 6¼d. Heavy oils, in bulk, North, 8¼d. to 8½d. Carbolic acid, 60 p.c., 2s. 2d. to 2s. 2½d. prompt. Naphthalene, £13 to £15; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.c., purely nominal; "B" quality, unsaleable.

Benzole Prices.

The following are considered to be the market prices to-day:

	s. d.	s. d.	
Crude benzole . . .	0 10½	to 0 11	per gallon at works
Motor ,, . . .	1 4½	,, 1 5	,, ,, ,,
90 p.ct. ,, . . .	1 7	,, 1 8	,, ,, ,,
Pure ,, . . .	1 10	,, 1 11	,, ,, ,,

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for June 27.]

Nos. 17,527—18,293.

CARROLL, L. D.—"Manufacture of carburetted water gas." No. 18,119.
HORSTMANN, A., and HORSTMANN GEAR COMPANY, LTD.—"Gas controllers." No. 17,533.
HUMPHREYS & GLASGOW, LTD.—See Carroll, L. D. No. 18,119.
HUMPHREYS & GLASGOW, LTD.—"Liquid seals for gas producers." No. 18,120.
HUMPHREYS & GLASGOW, LTD.—"Automatic coke charging of gas generators." No. 18,121.
NEWTON, J.—"Gas ovens." No. 17,550.
RADIATION LTD.—"Atmospheric gas burners." No. 17,897.
REDFERN, W. D.—"Gas-heated boilers." Nos. 18,226, 18,227.
ROSEWARNE, E. M.—"Gas stoves." No. 18,069.
STELFOX, J. C.—See Humphreys & Glasgow, Ltd. Nos. 18,120, 18,121.
YATES, H. J.—See Radiation Ltd. No. 17,897.

[Extracted from the "Official Journal" for July 4.]

Nos. 18,294—19,066.

CONSTANTINE, A. B.—"Gas cooking apparatus." No. 18,989.
GLOVER, W. T.—"Prepayment mechanism." Nos. 18,404, 18,405.
LILGE, F.—"Gas burners for furnaces." No. 18,365.
MCROBBIE, W.—"Dry gas meters." No. 18,743.
MASON, J. F.—"Charging belts for gas retorts." No. 18,504.
MAYLOR, J. A.—See Glover, W. T. Nos. 18,404, 18,405.
METERS, LTD.—See Glover, W. T. Nos. 18,404, 18,405.
PARKINSON, B. R.—"Wet gas meters." No. 18,367.
PARKINSON & COWAN (GAS METERS), LTD.—See Parkinson, B. R. No. 18,367.
SHARPLEY, R. W.—"Control means for gas stoves." No. 18,923.
STOREY FOUNDRY COMPANY, LTD.—"Regulating devices for atmospheric gas burners." No. 18,852.
STOREY, R.—See Storey Foundry Company, Ltd. No. 18,852.

Measuring Unpurified Gas.

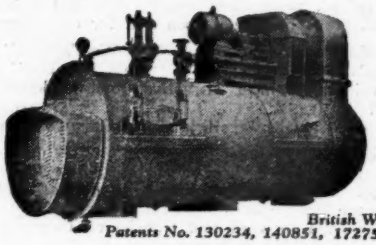
A writer in "Manufacturing Industries" states that the Milwaukee Coke and Gas Company daily meter some 24 million c.ft. of bye-product gas with two differential pressure type flow meters, one measuring the gas used in the coke ovens of the plant, and the other the surplus gas (about 10 million c.ft.) sold for local distribution. The flow meters are located near the ovens, where the gas still contains considerable quantities of sulphur, tar, and cyanogen, though most of the tar and ammonia are removed in the scrubbers through which the gas passes before entering the metering instruments. The gas which is sold is again measured at the point of delivery by standard wet gas meters; and the records so obtained check-up remarkably well with those furnished at the ovens by the flow meters, one of which has been in continuous service for over thirteen years. The cost of installing each flow meter was $395. The total operating cost per instrument, including all fixed charges, maintenance, allowances for cleaning, inspections, repairs, and so forth, and the incidental expenses of the daily charts, is $136 a year. By the former method of recording observations of tube readings at half-hourly intervals, the observer's time alone entailed an expense of $700 a year. The gas flow instruments thus entail only about one-fifth of the previous total expenditure.

"regarded as standard."

KIRKE
PATENT WASTE HEAT
BOILERS

FOR

GLOVER-WEST VERTICAL RETORTS
ALL OTHER MAKES OF VERTICAL RETORTS · HORIZONTAL RETORTS
INCLINED RETORTS · WATER GAS PLANTS · CHAMBER OVENS and COKE QUENCHING PLANTS.



British Waste Heat Boiler
Patents No. 130234, 140851, 172752, 186801, etc.

HERE
is part of an edifying conversation heard recently.

Chief Engineer of a Gas Company enquiring of another as to the points of Kirke Patent Waste Heat Boilers:

"Do you find the upkeep of these boilers expensive and do they pay?"

Chief Engineer of Gas Company already using Kirke Waste Heat Boilers:

"I put in two of them about three years ago and two more about two years ago. I haven't spent a sixpence on repairs and we have got back our capital 5 to 6 times over already."

The point is: Can you afford to ignore the existence of such a boiler? Why not let us instal them on your settings also?

SPENCER-BONECOURT
LIMITED
The Waste-Heat Recovery Specialists,
50-64 BROADWAY, WESTMINSTER, S.W.1.
'Phone: VICTORIA 2802-3.
Telegraphic Address: "BONECOURT, SOWEST, LONDON."

O & S

STOCK MARKET REPORT.

THE stock markets opened last week very quietly, and there was an indication that the lethargic conditions of the summer holiday season had commenced. The American monetary position and the tragic death of Captain Loewenstein, however, introduced disturbing influences; and although prices steadied again at the end of the week, markets closed in a less satisfactory position. It is anticipated that the making-up prices this week will show some heavy differences.

Gilt-edged stocks maintained their firmness in spite of the small number of dealings; but Foreign bonds were affected by the surrounding markets and were generally dull. The one bright spot in Home Rails was the improved interim dividends in the Underground Electrics, but otherwise several low records in the ordinaries were reached.

Gas companies' stocks were, like their commodity, bright and cheerful. Good results of both output and profit are informally reported, and it is confidently expected that the half-yearly, or interim, dividends will at least be maintained. Gas Light ordinary are being recommended by some brokers on account of the experimental process of low temperature carbonization which they are carrying out at the request of the Government. Investors with a knowledge of the industry realize that no advantage is anticipated or needed by the Company. It will be seen that the business done was again on improved prices, and that, other than two minor falls in foreign companies' stocks, the variations in the quotations were in an upward direction.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. July 6.	Rise or Fall on Week.	Transaction Lowest and Highest Prices.
£			%p.a	% p.a.				
171,978	Stk.	Feb. 9	6	6	Aldershot 5 p.c. max. C.	74—79	..	..
412,932	,,	,,	4	4	Do. 4 p.c. Pref.	69—72	..	..
1,551,868	,,	Apl. 13	7	7	Alliance & Dublin Ord.	93—96	..	93¼—94½
374,000	,,	Jan. 12	4	4	Do. 4 p.c. Deb.	64—67	..	..
522,654	,,	Mar. 8	7	7	Barnet Ord. 7 p.c.	109—112	..	..
300,000	1	Apl. 26	1/7½	1/7½	Bombay, Ltd.	21/—23/-	..	..
170,000	10	Mar. 8	8½	8½	Bournemouth 5 p.c.	12¼—13½	..	12/5/9—12/8
500,050	10	,,	7	7	Do. B 7 p.c.	12½—12⅞	+¼	..
375,000	10	,,	6	6	Do. Pref. 6 p.c.	10¼—11	..	..
50,000	Stk.	Jan. 12	3	3	Do. 3 p.c. Deb.	56—59	..	..
102,025	,,	,,	4	4	Do. 4 p.c. Deb.	76—79	..	..
357,900	,,	Mar. 8	7½	7½	Brighton & Hove 6 p.c. Con.	116—119	..	..
341,880	,,	,,	6/8/6‡	6‡	Do. 5 p.c. Con.	103—106	..	105—107
1,287,500	,,	Feb. 23	5	5	Bristol 5 p.c. max.	89½—90½*a*	..	..
885,000	,,	Mar. 22	6	7	British Ord.	113—116	..	115
100,000	,,	June 28	7	7	Do. 7 p.c. Pref.	111—114*	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	73—76*	..	77
200,000	,,	,,	5	5	Do. 5 p.c. Red. Deb.	94—97*	..	..
100,000	10	May 24	6	8	Cape Town, Ltd.	7½—8½	..	..
100,000	10	Apl. 26	4½	4½	Do. 4½ p.c. Pref.	6½—7½	..	..
150,000	Stk.	June 28	4½	4½	Do. 4½ p.c. Deb.	70—75*	..	..
626,860	,,	Feb. 23	6	6	Cardiff Con. Ord.	93—101	..	..
387,880	,,	June 28	7½	7½	Do. 7½ p.c. Red. Deb.	100—103*	..	..
157,150	,,	Feb. 23	5	6½	Chester 5 p.c. Ord.	88—93*b*	..	..
79,185	1	Apl. 26	‡2/-	‡2/-	Colombo Ltd. Ord.	31/—33/-	..	..
24,495	1	,,	1/4‡	1/4‡	Do. 7 p.c. Pref.	20/—22/-	..	..
375,402	1	Apl. 12	1/9‡	1/9‡	Colonial Gas Assn. Ld. Ord.	23/—25/-	..	..
187,348	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	20/—22/-	..	..
2,073,280	Stk.	Feb. 23	5	7	Commercial Ord.	98—101	..	99—99½
475,000	,,	June 14	3	3	Do 3 p.c. Deb.	57—60	..	58⅝
800,000	,,	Sept. 29	‡1	‡1	Continental Union, Ltd.	33—36	−1	34—34½
200,000	,,	Mar. 8	7	7	Do. 7 p.c. Pref.	90—95	..	9[illegible]
787,560	,,	Mar. 8	6½	7	Croydon sliding scale	108—113	..	111½—112
409,100	,,	,,	5	5	Do. max. div.	84—87	..	85—86½
492,270	,,	Mar. 8	7	10	Derby Con.	115—130*c*	..	..
55,000	,,	June 28	4	4	Do. Deb.	71—73*	..	..
302,000	,,	Mar. 8	5	5	East Hull Ord. 5 p.c.	76—79	..	..
50,000	,,	June 28	5	5	Eastbourne 5 p.c. Deb.	91—96*	..	..
1,002,180	10	Mar. 22	‡4	16	European, Ltd.	8—9	..	8⅞—8⅝
13,703,480	Stk.	Feb. 9	5	5/1/4	Gas Light & Coke 4 p.c. Ord.	18/9—19/3*f*	..	19/9—19/3
3,600,000	,,	,,	8½	8½	Do. 8½ p.c. max.	63—65	..	63½—65
4,157,030	,,	,,	4	4	Do. 4 p.c. Con. Pref.	78—81	..	79½—80
5,602,620	,,	June 14	3	3	Do. 3 p.c. Con. Deb.	60—62	+1	60½—61½
181,315	,,	,,	6	6	Do. 6 p.c. Br'tf'd Rd. Db.	103—106	..	..
1,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb.	98—100	..	98½—100
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Mar. 8	6½	6½	Hastings & St L. 5 p.c. Conv	87—90	..	..
858,710	,,	,,	5½	6½	Do. 8½ p.c. Conv.	68—71	..	..
70,000	10	Apl. 26	‡10	‡10	Hongkong & China, Ltd.	13½—14½	..	..
178,300	Stk.	Mar. 8	5	5	Hornsey Con. 8½ p.c.	83—85	..	..
1,976,000	,,	May 24	10	10	Imperial Continental Cap.	164—169	..	166½—163½
223,130	,,	Feb. 9	8½	8½	Do. 8½ p.c. Red. Deb.	68—70	..	..
235,212	,,	Mar. 8	7	7	Lea Bridge 5 p.c. Ord.	94—97	..	..
2,145,907	,,	Feb. 23	5½	5½	Liverpool 5 p.c. Ord.	92—93*b*	..	..
600,000	,,	Mar. 22	7	7	Do. 7 p.c. Red. Pref.	102—104*b*	+½	..
165,736	,,	Feb. 23	9	8	Maidstone 5 p.c. Cap.	114—117	..	..
75,000	5	June 14	‡8	‡8	Malta & Mediterranean	5½—6½	..	..
541,920	Stk.	May 24	‡5	‡7	Montevideo, Ltd.	94—96	+1	94½—95½
2,061,315	,,	Mar. 8	5	5	Newcastle & Gateshead Con.	16/9—17/3*d*	..	..
360,929	,,	,,	4	4	Do. 4 p.c. Pref.	74½—75½*d*	..	..
691,705	,,	June 28	8½	8½	Do. 8½ p.c. Deb.	65—66*d*	..	..
131,780	,,	Mar. 8	6/18/0	6/18/0	North Middlesex 5 p.c. Con.	97—100	..	..
800,000	,,	Apl. 26	9	7	Oriental, Ltd.	116—121	..	118
188,120	,,	June 28	7½	7½	Plym'th & Ston'house 5 p.c.	105—110*	..	..
414,800	,,	Feb. 23	7½	7½	Portsm'th Con. Stk. 4p.c. Std.	101—104	..	..
236,782	,,	,,	5	5	Do. 5 p.c. max.	77—80	..	..
2,334,464	1	—	—	—	Primitiva Ord.	25/—26/-	−/6	25/—26/1½
214,500	100	June 1	4	4	Do. 4 p.c. Red. Deb.	91—94	..	..
695,003	Stk.	Jan. 26	4	4	Do. 4 p.c. Red. Deb. 1911	77—79	..	..
416,345	,,	June 28	4	4	Do. 4 p.c. Cons. Deb.	75—77*	..	..
150,000	10	Mar. 22	6	6	San Paulo 6 p.c. Pref.	8⅞—8⅞	+⅛	8⅝—8⅞
270,000	Stk.	Mar. 22	6	6	Sheffield A	102—104*e*	..	..
419,968	,,	,,	6	6	Do. B	102—104*e*	..	..
1,047,003	,,	,,	6	6	Do. C	102—104*e*	..	..
90,000	10	June 14	6	8	South African	4—6	..	..
6,609,895	Stk.	Feb. 23	5	7½	South Met. Ord.	106—108	..	106½—107½
500,000	,,	,,	—	6	Do. 6 p.c. Irred. Pf.	110—113	..	111½—112½
1,895,445	,,	Jan. 12	3	3	Do. 3 p.c. Deb.	59—62	..	61½—62
734,000	,,	Mar. 8	6½	6½	Do. 6½ p.c. Red. Db.	100—102	..	..
91,500	,,	Feb. 23	8½	8½	South Shields Con.	112—113*d*	..	..
1,948,795	,,	Feb. 23	6½	6½	South Suburban Ord. 6 p.c.	105—108	..	106¾—107
368,837	,,	June 28	5	5	Do. 5 p.c. Deb.	96—99*	+2	..
647,740	,,	Mar. 21	5	5	South'mpton Ord. 5 p.c. max.	78—80	..	..
121,275	,,	June 28	4	4	Do. 4 p.c. Deb.	72—75*	..	..
250,000	,,	Mar. 8	7	7	Swansea 7 p.c. Red. Pref.	100—103	..	..
200,000	,,	June 28	6½	6½	Do. 6½ p.c. Red. Deb.	99—102*	+1	..
120,000	,,	Feb. 23	7½	7½	Tottenham District A 5 p.c.	117—122	+2	119½—120½
882,275	,,	,,	6½	6½	Do. B 3½ p.c.	95—98	..	96½—97½
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	98—101	..	..
181,256	,,	June 14	4	4	Do. 4 p.c. Deb.	76—79	..	76½
289,094	,,	Mar. 8	6½	6 5/8	Uxbridge, Maidenhead, & Wycombe 6 p.c.	90—95	..	..
68,330	,,	,,	5	5	Do. 5 p.c. pref.	86—90	..	..
80,000	,,	Mar. 8	8½	8½	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	129—134	..	..
255,636	,,	,,	7	7	Do. B 3½ p.c.	111—116	..	..
432,535	,,	,,	6/19/0	6/19/0	Do. C and New	98—103	..	..
352,000	,,	,,	6⅝	6⅝	Do. Wimbledon 5 p.c.	106—111	..	..
98,000	,,	,,	7½	7½	Do. Epsom 5 p.c.	112—117	..	..
200,000	,,	,,	5	5	Do. 5 p.c. Pref	86—91	..	..
88,416	,,	June 28	3	3	Do. 3 p.c. Deb.	56—59*	..	..
284,742	,,	,,	4	4	Do. 4 p.c. Deb.	75—78*	..	..

Quotations at:—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. *f*.—The quotation is per £1 of Stock. * Ex. div † Paid free of income-tax. ‡ For year.

The following transactions were recorded during the week:

On Monday, Brighton and Hove 5 p.c. 105, European 8 7/16, 8⅝, Gas Light and Coke 18s. 10½d., 19s. 0¾d., 19s. 1¾d., 4 p.c. preference 80, 5 p.c. debenture 99¾, 99⅞, Imperial Continental 168, Oriental 118, Primitiva 25s. 9d., 26s., 26s. 1½d., South Metropolitan 107½, 3 p.c. debenture 62, Tottenham "A" 119½, "B" 97. Supplementary prices, Brighton and Hove 6 p.c. "B" preference 108, Danish 7½, Hartlepool 5 p.c. maximum 83, Wandsworth 5 p.c. debenture 100.

On Tuesday, Brighton 5 p.c. 107, British 4 p.c. debenture 77, Commercial 99½, Continental Union 34, 34¼, Croydon maximum dividend 85, 86, European 8 7/16, Gas Light and Coke 18s. 10½d., 18s. 11¼d., 19s., 19s. 1¾d., 4 p.c. preference 79½, 5 p.c. debenture 99½, 99⅞, 100, Imperial Continental 166½, 167, 167½, 168, Montevideo 94½, 95, Primitiva 25s. 9d., 26s. 1¾d., San Paulo 6 p.c. preference 8⅝, 8 11/16, Tottenham "A" 120½, "B" 97.

On Wednesday, Croydon maximum dividend 85½, European 8½, 8⅝, Gas Light and Coke 18s. 9d., 18s. 10½d., 18s. 11¼d., 19s., 19s. 1¾d., 5 p.c. debenture 99¾, 100, Imperial Continental 168, 168½, Primitiva 25s. 6d., 25s. 7¾d., 25s. 9d., 26s., South Metropolitan 106⅞, 107⅛, 6 p.c. preference 111⅛, 112½, 3 p.c. debenture 62, South Suburban 5 p.c. 106⅞, Tottenham "B" 97, 97¾, 4 p.c. debenture 76½. Supplementary prices, Barnet 4 p.c. debenture 76, 77⅞, Eastbourne 3½ p.c. "B" 105, Tottenham 5 p.c. 98⅜.

On Thursday, Alliance and Dublin 93½, 94½, British 115, Commercial 99, 99⅜, 3 p.c. debenture 58¾, European 8 7/16, 8½, 8 9/16, Gas Light and Coke 18s. 9d., 18s. 10½d., 19s., 19s. 0¾d., 3½ p.c. maximum 63½, 65, 4 p.c. preference 79¾, 3 p.c. debenture 61½, Primitiva 25s. 3d., 25s. 6d., San Paulo 6 p.c. preference 8 9/16, 8⅝, South Metropolitan 106½, 107⅜, 3 p.c. debenture 61½, Tottenham "B" 96½. Supplementary prices, Barnet 4 p.c. debenture 77⅜, Gas Light and Coke 5 p.c. debenture 1952-57 100, Hartlepool 5 p.c. 82, 83, Preston 7 p.c. "B" 101.

On Friday, Bournemouth "B" £12 5s. 9d., 12 9/16, 12⅝, Croydon sliding scale 111½, 112, maximum dividend 86, 86½, Gas Light and Coke 18s. 10½d., 19s., 19s. 1½d., 19s. 3d., 3½ p.c. maximum 64, 64¼, 3 p.c. debenture 60¾, 5 p.c. debenture 98½, Imperial Continental 167, 167½, 168½, Montevideo 95, 95½, Primitiva 25s., 25s. 3d., 25s. 9d., South Metropolitan 106½, 106⅝, 107, 107½, South Suburban 107. Supplementary prices, Gas Light and Coke 5 p.c. debenture 1952-57 100, Hartlepool 5 p.c. debenture 100, Liverpool 5 p.c. 92, 92¼, 92½, Preston 10 p.c. "A" 137.

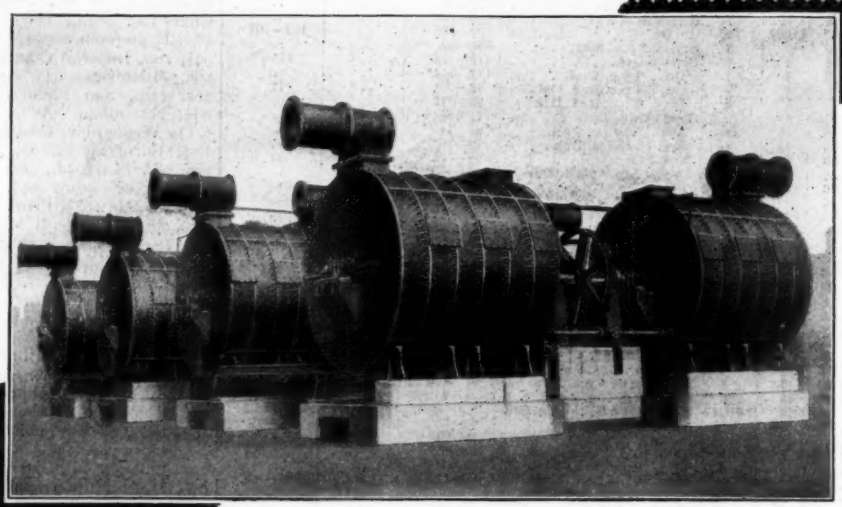
In Lombard Street money was plentiful, and no difficulty was found in obtaining overnight money at 2½ p.c., and, in fact, in some instances 2 p.c. was quoted. As expected, Treasury Bills were allotted at a lower rate; the average being £3 14s. 0·25d. p.c., or 2s. 6·71d. p.c. below the previous week's rate. Discounts were easier in consequence.

On the Foreign Exchange Market the dollar-sterling moved in favour of the dollar, closing at 4.87½; French francs were quoted at 124.20½; Italian lire were steady at 92.78½; the Belgian rate declined to 34.91½; pesetas were down to 29.51; and Dutch florins were easier at 12.09½.

Silver was slightly firmer at 27½d. per oz., and the price of gold remained at 84s. 10½d. per oz.

The Bank Rate is 4½ p.c.t., to which it was reduced from 5 p.c.t. on April 21, 1927. The banks' deposit rate is 2½ p.c.t., and the deposit rates of the discount houses are 2½ p.c.t. at call and 2¾ p.c.t. at notice.

BRUSH PATENT ROTARY WASHERS



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THE installation illustrated above is a typical example of the most up-to-date practice in gas washing plant.

The new "1920" Patent Holmes Washer is the result of careful large scale research and repeated tests combined with a long experience of the problems involved.

Simplicity and robust construction, and a minimum of slow-moving parts ensure freedom from breakdown and low upkeep cost.

These machines are now being installed on Gasworks and By-product Recovery Plants with guarantees of the highest efficiency for:—Ammonia recovery, benzol and light oil extraction, and for the removal of naphthalene and moisture by our Patent "Dri-Gas" process.

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